# THE ENGINEERING AND MINING JOURNAL

Entered at the Post-Office of New York, N. Y., as Second-Class Matter.

VOL. XXXVI. No. 11.

RICHARD P. ROTHWELL, C.E., M.E., ROSSITER W. RAYMOND, Ph.D., CHARLES KIRCHHOFF, Jr., M.E., } Editors.

NOTE.—Communications relative to the editorial management should be addressed to EDITOR, P.O. Box 1833, New York.

Communications for Mr. RAYMOND should be addressed to ROSSITER W. RAYMOND P.O. Box 1465, New York. Articles written by Mr. RAYMOND will be signed thus * ; and only for articles so signed is he responsible.

SUBSCRIPTION PRICE, including postage, for the United States and Canada, $4 per annum ; $2.25 for six months ; all other countries, including postage, $5.00 = 20s. = 25 francs = 20 marks. All payments must be made in advance.

FILE COVERS will be sent by mail for $1.25 or delivered at office for $1 each.

**Advertising Rates.**—See page vii.

Mr. C. A. Green is our accredited representative for New York.

Mr. A. R. Brown, Jr., is our accredited representative for Boston and the Eastern States. Office, Room 1, Simmons Building, 40 Water street, Boston.

Mr. J. Viennot, 150 South Fourth street, Philadelphia, is our accredited representative for Philadelphia.

Mr. A. H. Taylor, 159 Lake street, Chicago, is our accredited representative for Chicago and the Northwest.

Mr. O. D. Cotton, Columbus, O., is our accredited representative for Ohio, Kentucky, and Indiana.

Mr. O. J. Frost, care Boston & Colorado Smelting Company, Argo, Colo., is our accredited representative for Denver and vicinity.

REMITTANCES should always be made by Post-Office Orders or Bank Drafts on New York, made payable to THE SCIENTIFIC PUBLISHING COMPANY.

**THE SCIENTIFIC PUBLISHING CO., Publishers.**

R. P. ROTHWELL, Pres. HENRY M. GEER, Sec. and General Manager,

**P.O. Box 1833. 27 Park Place, New York.**


CONTENTS.


EDITORIALS : PAGE.

The Meeting of the American Society of Mechanical Engineers..... 161
The Alabama Iron and Coal Lands.. 161
The Way in which the Managers of the Lucy Furnace Got Rid of their Cinder..... 161
The Duyea Process at Silver Cliff..... 161
An Unfortunate Struggler with the Mysteries of Mineralogy..... 161
Mr. John Jarrett Mixing up Cause and Effect..... 161
The New English Patent Law..... 161
The Position of Lead ..... 162

CORRESPONDENCE :

The Early Discovery of Tin in the Black Hills..... 163
Granulite in Canada..... 163
Bessemerizing Copper Matte..... 163

The Discovery of Tin-Stone in the Black Hills of Dakota..... 163
Notes on Explosives for Mining..... 164
The Cummer Engine..... 165
The Mining and Metallurgy of Zinc in the United States..... 168
Mistakes in Mining..... 169
Furnace, Mill, and Factory..... 169

NOTES : PAGE.

Consumption of Forest Products as Fuel..... 163
Anthracite Coal in Idaho..... 165
Driving Machinery by Sand..... 167
The Duty on Round Iron..... 169
Tubes and Wires Underground..... 169
The Production of Austrian Mines and Smelting-Works in 1882..... 169
Mineral Patents Granted by the United States Land-Office..... 172

GENERAL MINING NEWS :

Arizona..... 170
California..... 170
Colorado..... 170
Dakota..... 171
Idaho..... 171
Mexico..... 171
Michigan..... 171
Montana..... 171
Nevada..... 171

FINANCIAL :

Gold and Silver Stocks..... 173
Copper Stocks..... 173

METALS..... 174
BULLION MARKET..... 174
IRON MARKET REVIEW..... 174
COAL TRADE REVIEW..... 176
Advertisers' Index..... xii


THE annual meeting of the American Society of Mechanical Engineers will be held in this city on the 3d of November.

A STATEMENT has appeared in some of the newspapers in this city, to the effect that a decision has been reached in reference to Alabama coal and iron lands. Our correspondent in Washington has been unable, by personal application to the heads of departments, to verify this rumor. For some mysterious reason, which it is suspected is of a political character, all claims of the kind are now uniformly suspended.

AN interesting example of the originality which American iron-makers bring to bear upon the solution of exceptional problems is furnished by the manner in which the managers of the Lucy furnace, at Pittsburg, got over the difficulty of handling their cinder. There was no room for dumping in the vicinity of the works; and after many and expensive experiments, cars were designed which allow the cinder to be carried over long distances in a liquid condition. It is related that the cinder was thus in one winter carried a distance of forty miles, to help break up an ice-gorge, or rather melt it away—a feat which was successfully accomplished.

THERE has been much rejoicing in Silver Cliff, Colo., over what is termed the brilliant success of the Duryea process. There has been a banquet, the band has played, and toasts have been drunk, and Silver Cliff's citizens are reported to be at "fever-heat," though it is not stated whether the toasts did it. We regret that in their excitement the Silver Cliffians have not as yet submitted any very intelligent account of what was done at the furnace, and how it was done. We are inclined to believe, however, from stray data in the columns of our Colorado contemporaries, that the process has undergone some modification since the time we last heard of it. It seems that the silver is not converted into a vapor which is leisurely condensed, but that "slag and molten lead pass automatically from the cylinder into the sump." We await the publication of a full record of work without "fever-heat," and trust that we may soon be able to place the result before our readers.

MINERALOGY and geology are sciences with which a mining engineer strives to familiarize himself. Many of those eminent self-made mining engineers who infest some of our mining camps are conscious of the fact that it impresses the average layman to hear hard words. Their efforts to talk wisely would be amusing if they were not occasionally dangerous. The latest example of an unfortunate struggler with the mysteries of mineralogy is Mr. F. P. THOMPSON, M.E., of Monterey, who, as he tells the world in a report on the Minas Viejas of Villaldama, Nuevo Leon, Mexico, has "followed the avocation of mining during a quarter of a century." If he has, he has learned nothing worth knowing since he began. According to our authority, who may be able to wield a pick well enough, the country-rock of the Villaldama District is granite and the dike "siliceous limestone or quartzite." The copper ores are "sulphate and carbonate, and nearly all of them silver-bearing. Some of the latter contain so large an amount of gold that they become in fact a gold ore, with which copper is only associated. These characteristics will probably continue until water-level is reached, when the ore will become a sulphate and be much richer, assuming the character of 'brognordite'—a complex compound of antimony, arsenic, sulphur, lead, and silver, which yields readily to the lixiviation process." The so-called "brognordite" carries from 46 to 48 per cent of lead. We advise Mr. THOMPSON to stop writing. He is weak on mineralogy, geology, and metallurgy. Unfortunately, he is a type of a class to whom we respectfully but earnestly tender the same advice.

MR. JOHN JARRETT, ex-President of the Amalgamated Iron and Steel Association, recently testified before the Senate Committee on Education and Labor, whose members, by the way, have been forced to listen to an endless gush of bosh. Mr. JARRETT is conceded to be a clear-headed, intelligent man, of much executive ability, and his utterances on the subject of the condition of the miners and iron-workers, if not accepted as conclusive evidence, are at least listened to with respect. Mr. JARRETT is quoted as saying, concerning the miners: "In consequence of their utter demoralization, they spend at least one half of their earnings in drink." That the latter is, unfortunately, one of the most serious circumstances connected with our mining population, there can be no doubt whatever. The appeals constantly made by their own mates, in the labor journals, to the body of the miners, furnish confirmatory evidence of the fact. We believe, however, that Mr. JARRETT is slightly mixing up cause and effect. A man "demoralized" by lack of work or poor pay does easily take to drinking ; but the trouble is generally brought about in just the other way. The men have the bad habit, are shiftless, lazy, apt to jump at the first opportunity to pose as the martyrs of "grinding monopoly," etc. The leaders of the miners' organizations recognize the evil, and yet their efforts, based as they are upon a mistaken notion of the "dignity of labor," are misdirected. We do not want them to become temperance apostles, because that would not do any good ; but they could do much toward diverting the occupations of the men in their leisure hours into better channels. They would, in the end, accomplish more real good than by going about preaching strikes, or persecuting "scabs," as they occasionally do. Their main work, of course, is to organize, and to further such methods as arbitration, which is entirely proper and right. But they only too frequently agitate in the manner indicated, while they ought to be at work creating reading-rooms and providing popular lectures and other means of instruction and diversion.

## THE NEW ENGLISH PATENT LAW.

After much discussion and quite extensive modification, the new English patent bill has become a law. Its provisions will be closely scanned by Americans, because in no country outside of their own are the rights conferred upon inventors by the patent laws so valuable as in Great Britain. In many leading industries, the race between British and Ameri-

can specialists is very close, and improvements brought out on either side of the Atlantic are eagerly watched on the other. The liberality of our own patent laws has favored English inventors, while the provisions in England have checked a corresponding utilization of American inventions there. The new law enacted in Great Britain begins to approach our own in at least one important particular, that of reducing the fees. Briefly, the system adopted is the following: An inventor must send to the patent-office a provisional specification, and, on applying for provisional protection, pays a fee which has been reduced from £5 to £1. The application passes the scrutiny of an examiner, who decides whether or not the specification fairly describes the invention, whether its title sufficiently indicates its object, and whether the application conflicts with any other unsealed application. Appeals from this examiner's decisions go to the law officers of the department. The applications may be made directly to the office by post, without the intermediacy of an agent; but certain provisions in the new law make such a case dangerous, and the experience of most inventors in this country with our liberal office has been such as to generally discourage any such attempts at saving the agent's fees. When the provisional specification has been approved—remaining secret until that time—the inventor must prepare his final specification within a period of nine months from the date of application. It is again passed upon by the examiner, and then is open to public inspection, and is sealed when passed by the comptroller. The government fees for completing the patent for the first term of four years are £3 now, instead of £20 formerly. There is no alteration in the amount of the subsequent payments for the extension of patents from the first term of four to fourteen years; but in place of paying the £50 and £100 in lump sums at the end of the third and seventh years, these amounts are payable under the old law at the option of the patentee, either in one sum of £50 at the end of the fourth and £100 at the end of the eighth year, or by annual payments of £10 before the end of the fourth, fifth, sixth, and seventh years, £15 before the end of the eighth and ninth years, and £20 before the end of the tenth, eleventh, twelfth, and thirteenth years. The English patent-office has therefore made a compromise between its old system and that in force in this country. It has justly made it easy for the poorest to obtain protection for his invention, but still exacts a tribute from a patentee when he presumably has had ample opportunity to gather some slight return from it. A patent that has not shown vitality enough during a period of four years of freedom from payments to survive an annual expenditure of £10 deserves to lapse. We have too many idle patents waiting until some one else will make room for the invention, in order to force a round price for an investment of one hundred dollars, more or less, in a "bright idea." Thus far, the provisions of the new English patent law will, on the whole, meet with the approval of thinking inventors and manufacturers.

There is, however, a very vicious clause, awkwardly framed, which we fear may be used by unscrupulous persons, particularly to the prejudice of foreign inventors. It reads: "If, on the petition of any person interested, it is proved to the Board of Trade that, by reason of the default of a patentee to grant licenses on reasonable terms, (*a*) the patent is not being worked in the United Kingdom; or (*b*) the reasonable requirements of the public with respect to the invention can not be supplied; or (*c*) any person is prevented from working or using to the best advantage an invention of which he is possessed, the Board may order the patentee to grant licenses on such terms as to the amount of royalties, security for payment, or otherwise, as the Board, having regard to the nature of the invention and the circumstances of the case, may deem just, and any such order may be enforced by mandamus."

The object of this clause is too evidently that of preventing a misuse of the exclusive rights granted to inventors by patentees. It may be intended to meet such contingencies as the refusal of a foreign inventor to allow English manufacturers to enjoy the benefits of an improvement, or of an English inventor to moderate real or imaginary extortionate claims for compensation. It may be the desire to guard against high prices of patented articles by keeping the supply limited, or may be proposed to check any attempts to block progress by withholding the use of prior patents. We have in this country repeatedly felt and, in some industries, are still suffering under the evils to which such abuses of the rights of patentees occasionally lead. But still we do not believe that compulsory licensing in the form proposed by the new English law would commend itself to any one. The provision is framed so indefinitely that it is difficult to understand how it could pass the scrutiny of legislators or the public and the press, without the most vigorous protests. It puts a power into the hands of unscrupulous or influential manufacturers against poor inventors, which will probably be wielded in more than one case to browbeat the latter. It leaves it in the hands of government officials to decide what are "reasonable terms" for licensing. In England, as well as elsewhere in the world, government officials are generally the very last to whom such questions should be submitted for decision, because the fact that they are not in daily contact with the business community renders them unfit for it. It is to be sincerely regretted that the new English patent law is marred by such provisions, which, we repeat, will be particularly dangerous to foreign patentees, because the sympathies of judge and jury in cases coming under it will be against them.

## THE POSITION OF LEAD.

The course of the lead markets should be closely watched by the majority of miners, particularly in Colorado and Utah, because its fluctuations largely affect the returns for ores shipped to smelters. Like every other metal produced in this country, though in a less marked degree, lead has almost constantly declined since the beginning of the present year, as the following summary of the prices will clearly show:

PRICES OF LEAD IN NEW YORK IN 1883.

| | Range. | Average. |
|---|---|---|
| January | 4·50 @ 4·70 cents. | 4·65 cents. |
| February | 4·50 @ 4·60 " | 4·55 " |
| March | 4·50 @ 4·65 " | 4·55 " |
| April | 4·40 @ 4·62 " | 4·50 " |
| May | 4·30 @ 4·55 " | 4·40 " |
| June | 4·40 @ 4·45 " | 4·40 " |
| July | 4·30 @ 4·40 " | 4·32 " |
| August | 4·20 @ 4·30 " | 4·25 " |

On the whole, the market in this city has shown less buoyancy than that in the West, where consumption has been going on at a less slackened pace than in the East, particularly for corroding purposes. The result is, that the views of those interested in the metal on the Atlantic coast are liable to be tinged with a less hopeful tone, while on the other hand, we fear that the confidence of producers in the West is not quite warranted by the situation. It will be well to look the matter squarely in the face. Two facts, we believe, will be generally conceded: consumption throughout the country, East and West, has not, thus far, been as large as it was last year; while production has been heavier than ever before. The result has been an accumulation of stock which some have estimated as high as from 20,000 to 25,000 net tons. It is probable that this guess is not very far from the truth. One point, however, must be considered in connection with this stock, which somewhat modifies the force with which those who argue from its existence point to it. As usual, consumers have bought sparingly on a falling market, particularly as they, like all prudent business men during the current year, have shrunk from adding unnecessarily to their engagements. We believe, therefore, that an inventory of the manufacturers throughout the country, if made now, would show a marked decline in the stock of raw material held by them. The producers and their agents have been carrying more than their usual share of the surplus. It is concentrated in the hands of a few parties, who have recently by their firm attitude stayed the gradual decline of the metal. Consumers, on the other hand, convinced that holders must weaken under a load to which they must add constantly to sustain their position, are obstinately buying only to cover pressing needs. The representatives of the three or four works which are carrying the stocks, however, look forward to the time when the exhaustion of supplies of raw material will force buyers to enter the market for large lots. Much depends on the activity of the demand for shot and the inquiry for building purposes. Should the fall trade prove a disappointment, manufacturers will have no trouble in supplying themselves through those producers who, under the circumstances, believe in the policy of selling lead as fast as they make it. Their number and the capacity of their works are, we believe, rather in the majority, and therefore it is likely that the present deadlock, with its stiff nominal prices, may continue for quite a long period. There is also the danger that, should the candle be held too high, one or two more of those who are carrying heavy stocks will unload on the market, leaving the others to bear their burden as best they may. Unless the consumption increases considerably, lead can not ultimately resist the pressure because production is going on unabated. For weeks and possibly for months to come, it will hold its own, or may even be pegged up; but this steadiness should not deceive producers as to the dangers with which the metal is beset.

This fact should be borne in mind: There is no scarcity of lead, no exceptional consumption to warrant even current figures, but the metal is artificially sustained. In common with all producing interests, we hope that an expansion of consumption will warrant the prices now asked. They are fairly remunerative to the makers in the different sections of the country. The latter, however, should be prepared to meet every contingency, and do all within their power to reduce the cost of production. The present period of uncertainty will certainly enable buyers of ores to dispose of the purchased metal without a steady loss, which they must suffer on a constantly declining market. According to their view of the future of business in general, miners, we presume, will show an inclination to make long contracts if they are pessimists, or hold back if they are sanguine. Weighing all the evidence which has come under our observation, we are inclined to believe that little is to be gained by the latter course.

## CORRESPONDENCE.

[Communications will be noticed only when accompanied with the full name and address of the writer. Unless specially desired, only initials will be printed. We invite criticism and comment by the readers of the ENGINEERING AND MINING JOURNAL. Replies not intended for publication should be addressed to the Editor of the ENGINEERING AND MINING JOURNAL in blank, stamped, and sealed envelopes. We do not hold ourselves responsible for the opinions of our correspondents.]

### The Early Discovery of Tin in the Black Hills.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your "Correspondence" column of August 25th, "Glück Auf," writing from the Black Hills, speaks of the recent discovery there of tin in paying quantities. In view of the importance which attaches to the discovery of valuable tin ore in the United States, it may be of interest to relate how, as far back as 1876 or 1877, Mr. Richard Pearce, of the Boston & Colorado Smelting Company, then at Black Hawk, Colorado, discovered tin which came from the Black Hills country. A prospector, sending ore-samples from that section to the Boston & Colorado Smelting Company for assay, unable to secure currency, sent gold-dust in payment. Examining the gold-dust, Mr. Pearce found some black grains, which proved not to be magnetic iron, as might have been expected, but tin oxide. Interested, of course, he sent at once to the prospector for samples of the black sand from which the gold-dust of his section was obtained. The samples which were received contained high percentages of tin oxide; but the region was then much more difficult of access than at present, and investigation was carried no farther. It is to be hoped, however, that the improved transportation facilities for the Black Hills, now that both vein ore and placer deposits of tin have been discovered, may warrant the investment of capital, and at no distant day result in the profitable production of tin in the United States. J.

DENVER, COLO., Sept 5.

### Granulite in Canada.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: The article in last week's ENGINEERING AND MINING JOURNAL on the subject of Glass from Granulite by the Siemens process is one which is very interesting. I had occasion, a few months ago, to inquire fully into the subject while in London; and one of the directors sent a specimen of a railroad tie out here, which is now in Philadelphia. The purpose then was to sell the patent for America, or to obtain orders. The latter was found impossible, the answer given by the railroad companies being, that in a country like America, where timber was plentiful, there was no advantage in adopting glass ties. Then, with regard to the patent, the first thing necessary was to find the quality of mineral suitable for the purpose. To obtain this, I went into Canada last June, and pitched my tent on the various islands situate on the inland lakes, conveniently placed for cheap and easy transit. The result of my travel, extending over one hundred miles, was the discovery of immense deposits of suitable granulite; also beautiful pink granite, relieved by the presence of mica and feldspar, making a magnificent stone for building purposes. I also met with virgin iron lodes, and one copper lode. A great part of the country through which I passed abounded in phosphate of lime, as well as limestone, to say nothing of the enormous deposits of red and yellow sandstones.

Doubtless some of your readers have prospected the banks of the Hudson, as well as the Adirondacks. If so, I should like to know something of the strata. I am sir, yours obediently, T. B. ALDERSON,

NEW YORK, Sept. 8. Mem. Inst. M.E. Eng.

### Bessmerizing Copper Matte.

EDITOR ENGINEERING AND MINING JOURNAL:

SIR: In your issue of July 7th, I note a letter from Dr. Percy, the eminent English metallurgist, which I can not allow to pass without a reply. I regret that Dr. Percy did not take the trouble to read my English patent. He would have recognized that my process of treating copper ores differs essentially from the one patented in 1856 by Mr. Keates.

I need not call attention to the fact that if Mr. Keates had really discovered in 1856 a more economical and truly industrial process, he would certainly have applied it since on a large scale in the Swansea or Liverpool copper-works. This has not been done—not even, I may venture to say, in the works belonging to the inventor.

Besides this, Dr. Percy himself, who has since published a treatise on the metallurgy of copper, does not say a word on this method, which he would not have failed to allude to if it had produced results.

I have stated in the foregoing, and I will show, that my process differs completely from the one to which Dr. Percy points. My process is based on doing away with coal for the purpose of producing the necessary temperature, which is solely generated by the intermolecular combustion of the iron, the sulphur, and the other metals which are more readily oxidized than the copper in the matte. Is there any thing similar in the description in the Keates patent? None; on the contrary, the specification calls for a heated reverberatory in which the operation is carried out. Consequently, the use of fuel is necessary. It is distinctly stated, in the description, that it is necessary to raise the temperature of the furnace, in order that the matte may remain in a state of complete fusion during the action of the blast.

The intermolecular combustion to which reference is made in the above, and which is the foundation of my process, has led me to design a special apparatus which does not resemble the reverberatory furnace described in the Keates patent. I believe that these explanations will suffice to make the subject clear to your readers. PIERRE MANHES.

LYONS, FRANCE.

---

A RECENT bulletin of the Census Bureau is that giving a partial estimate of the consumption of forest products as fuel. It appears that 32,375,074 persons use wood for domestic purposes. Illinois consumed during the census year 5,200,104 cords, value, $14,136,662; Indiana, 7,059,874 cords, value, $13,334,729; Iowa, 5,090,649 cords, value, $14,611,280; Minnesota, 1,669,568 cords, value, $5,873,421; Michigan, 7,838,904 cords, value, $13,197,249; Wisconsin, 7,207,126 cords, value, $11,863,739; Dakota, 422,948 cords, value, $3,028,300; Montana, 119,947 cords, value, $460,638.

## THE DISCOVERY OF TIN-STONE IN THE BLACK HILLS OF DAKOTA.

Written for the Engineering and Mining Journal by William P. Blake, F.G.S.

(*Concluded from page* 146.)

### QUANTITY OF THE TIN ORE.

The extent and quantity of the greisen rock and the percentage of tin-stone in it are the two most important questions in an economical and mining point of view. As regards the first, the chief evidence, at present, is in the outcrops or exposures at the surface. These are extensive and decidedly encouraging. Without regarding the possible occurrence of massive ore in bunches, and confining the estimate to the greisen rock alone, it may be said to crop at intervals over a length of 100 feet by from 70 to 100 in breadth. These outcrops are irregular in form, and vary from two feet to twenty feet, or more, in width. There are four chief outcrops, all showing tin ore. Very little work has yet been done to open up these outcrops of greisen. An open cut some twenty-five feet long and about fifteen feet deep at the face is the largest excavation. It cuts through the pit which was sunk at first for mica, and followed the heavy black ore downward. In cutting this opening, a considerable quantity of the greisen rock has been blasted out, showing specks and grains of tin ore throughout its substance. This greisen should be regarded as the chief and most reliable ore, though no doubt many masses and branches of the massive cassiterite will be developed, apart from the greisen when the ground is opened. The greisen is favorably placed for cheap mining: the surface of the hill slopes off from it each way, permitting it to be attacked by cuts or open quarry in several directions. It is easily drilled for blasting, and the most effective and economical method of getting it out, in quantity, will be to work it in open quarry, putting in heavy blasts, and then cracking up the large blocks by smaller holes, letting the fragments roll to the base of the hill, where, by means of a suitable barrier of pine logs, forming a rude ore-bin, they may accumulate and be delivered as needed through chutes into cars below, thus avoiding the expense of lifting and handling. The cars should then deposit the rock at the top of a mill, so arranged that the ore need not be again handled or lifted until the concentration is complete.

The greisen rock can be crushed with great ease, either under stamps or by rolls. The tin ore separates easily from the mica and spar, and, after crushing, can be washed out by the ordinary methods of panning or concentration. This was demonstrated by many trials in panning. There is very little loss. The ore settles to the bottom, and deports itself very much as gold does in panning out. The ordinary concentrating apparatus will handle the tin-stone effectively. Water is abundant at all seasons, except probably for a time in the depth of winter, when the snows do not melt fast enough to fill the rivulets.

On reaching the mill, the broken rock should pass over coarse grates, in order to separate the heavy blocks from the medium-sized masses. There should be three rock-breakers; one of unusual size, to receive masses of rock from 15 to 24 inches in diameter, and the others to take the product of the first breaker together with the other masses that are suitable for a 15 by 9 breaker. The two 15 by 9 breakers should be arranged to have automatic feeding, which can be easily secured, and would effect a great saving. The crushed ore can then be passed through rolls, or directly to the stamps. If stamps are used, the grates should be coarser than for gold quartz, and slotted punched screens will no doubt deliver the mica much freer than woven wire screens, or screens punched with round holes.

### PERCENTAGE OF TIN-STONE.

Ordinary hand samples of the greisen, taken from the large masses broken from the open cut, and rejecting the richer portions, will yield from 6 to 10 per cent of clean tin-stone, or black tin, of high grade. Some masses will yield from 10 to 50 per cent by weight; but the general run of the ore is about 6 per cent, excluding the poorer portions. The general average of samples broken from all parts of the outcrops at the surface is about 3 per cent. It is certain that there will be no difficulty, when the ground is opened by blasting, in selecting the rock so that an average of at least 3 per cent can be maintained, if this limit shall be found desirable. But it is probable that rock containing only 1 per cent may be profitably worked if the mill is properly placed and equipped.

The percentage of tin-stone, or black tin, in the greisen, it will be seen, compares favorably with the percentage of tin-stone in the ores of other and well-known tin regions. In Cornwall, for example, where the statistics of tin mining and smelting are carefully kept under the direction of the government, it is found that the average percentage of black tin in the whole mass of tin ore as mined and stamped, or prepared for dressing, is not over 45 pounds to the ton, or 2 per cent. So, also, at Altenberg, Saxony, the smelting ore, or black tin, is 2 per cent of the whole mass. But a much lower percentage than this has been worked. According to Phillips and Darlington, it did not exceed 17¼ pounds of black tin to the ton at one of the largest mines in West Cornwall in 1855; this being equivalent to 0·86 per cent. The same authority, in describing the effectiveness of the ordinary stamp-mill in crushing tin ores, gives the following figures: The average number of stamps in use at the Polberro mines was 70, and the number of tons crushed in the course of five years was 106,249 tons. This quantity averaged $20\frac{1}{6}$ pounds, or 0·89 per cent of merchantable black tin per ton. The profit per stamp amounted to £210 for the whole period, or £42 per stamp per annum.

### STREAM-TIN.

Stream-tin, or alluvial tin ore derived from the disintegration of the veins and rocks, occurs here as in all important tin regions, and it promises to play an important part in the future development of the region.

It is found, as might be expected, in the water-courses which head at and near the Etta claim on Tin Mountain, and in other places, thus giving good evidence of the existence of other veins and resources than those on Tin Mountain. On Battle Creek, between the Etta location and Harney City, in sluicing for gold, a large quantity of heavy black mineral in grains from the size of peas to the magnitude of pigeon-eggs and larger are abundant. This heavy black ore has always been a hinderance to the placer miners on that stream, and has been thrown away as useless. I

find it to consist largely of tin ore of good quality; some of it shows small adherent scales of mica, indicative of its derivation from greisen.

It is not easy to reach the bed-rock along this creek, owing to the abundant supply of water and the deficient drainage, without a bed-rock flume, which has been proposed by the gold miners for the gold alone. It is now probable that both the stream-tin and the gold will be mined together, and to much greater advantage than if worked alone. Prospecting for stream-tin along the valley of this stream is still in progress.

The ore has been found also on Iron Creek, and later on Spring Creek, ten miles or more north of Tin Mountain. This last is comparatively free from fragments of a heavy black mineral, apparently wolfram, which accompanies all the stream-tin ore yet found, but which is harder than wolfram and has a lower specific gravity (h. 6; sp. gr. 6·1 to 6·7). Several species are probably represented in the alluvial concentrations; but there is a notable absence of magnetite, of hematite, and of chromite.

The evidences, so far, go to show that there is an extensive region of deposits of stream-tin, and that tin ore must occur at many distant points in abundance; and in the case of mining it, it must hold a relation to the parent sources similar to that of placer gold to the gold in veins. In alluvial tin mining, the production per hand per day must depend, of course, chiefly upon the abundance of the ore and the depth of gravel and clay under which it lies. The "*pitting-off*," or removal of the top stuff, is the chief item of cost. The same methods and economies of working practiced in alluvial gold mining are applicable here also. The rockers, toms, and sluices, as well as the hydraulic and drifting methods, are all available. Water and fall, or grade, are essential. The bulk and quantity by weight are, of course, very much greater than in the case of gold, and some modifications of riffles and sluices are required. The work is not so delicate, and may be more roughly and rapidly carried on than it can be when gold is to be saved.

The larger part of the tin of commerce is obtained from stream-tin. In Cornwall, at first, the tin ore was obtained solely from the alluvions of the tin region; and even as late as 1876, it is reported that 800 persons were engaged in mining for stream-tin on Red River. A considerable amount of ore is yet obtained from stream-deposits rather than from veins; and at the present time, the great production of New South Wales is from alluvial tin ores, such as were shown in profusion at the Centennial Exhibition, and again at Paris in 1878.

According to Professor Liversidge, the tin-bearing area in New South Wales is estimated at 8500 square miles. The production up to 1882 was 62,268 tons, valued at £4,339,461. The ore occurs in veins and as stream-tin. The veins traverse granite, and are considered to be like those of Cornwall. The ore is found, also, in veins of greisen, and in granulite or eurite. Sometimes the ore is found disseminated in large and well-formed quartz crystals.

The stream-tin ore occurs in much the same manner as gold, and in drift or stream-deposits of different periods of deposition and at different levels. Two distinct sets have been recognized, the older and the newer. Some of the deposits are worked under 60 or 70 feet of basaltic capping. The older tin-stone deposits are frequently so closely cemented as to require stamping. The ore is usually obtained by sluicing or by jigging. Wolfram is not abundant.

The Banca and Billiton tin is chiefly from alluvial ore, which is mined by Chinese labor.

According to Davies, at the alluvial tin mines of Banca, a miner, with the aid of water, removes from 350 to 530 cubic feet of earth in nine hours, or by estimate 12,000 cubic feet yearly, with an average product, after smelting the black tin, of twelve hundred pounds of metallic tin. In Australia, stream-tin miners are reported to handle 10 tons of earth daily.

The Chinese miners of Banca have an ingenious and simple apparatus for prospecting the deposits before digging. It consists of an iron rod about an inch in diameter and twenty feet long, which is forced down through the upper layer of sand and clay to the bed-rock. A small conical tube at the lower end serves to catch and retain a sample of the gravel from the bed-rock, and will show the presence of tin ore if it exists in sufficient quantity. A copper tube with a steel shoe is also used to obtain samples. An apparatus of this kind would be very useful at the Black Hills, particularly in the small valleys where there is a large amount of water in the soil.

The annual production of Banca tin is about 4000 tons. In the island of Billiton, the production in 1876 was 3721 tons.

## NOTES ON EXPLOSIVES FOR MINING.

Sir Frederick Abel, of Woolwich Arsenal, who ranks among the very highest European authorities on the manufacture and application of explosive compounds, has, in a presidential address before the Society of Chemical Industry, made a number of observations which can not fail to be of interest to the mining public. This address is largely historical, and naturally refers frequently to subjects coming within the domain of an ordnance officer. From the long document, we choose the following extracts:

So far as mining or blasting-powder is concerned, its production at a comparatively very low price, and the absence of any standard or test of power, contributed to maintain the manufacture in a stationary condition, except in so far as any expedients could be adopted for increasing the margin of profit of the manufacturer, until, about twelve years ago, more violent explosive agents began to enter into serious competition with it. The attention which dynamite and gun-cotton had already excited at about that time, and the recognition of the fact that blasting-powder might be economically and otherwise advantageously replaced in many kinds of mining work by explosive agents more rapid and more violent in their action, led to the invention or resuscitation of a great variety of explosive mixtures for which special advantages were claimed. The greater number of these have enjoyed a very brief and inglorious existence. On the other hand, some preparations of nitro-glycerine and gun-cotton have become so firmly established as valuable blasting agents that the manufacturers of blasting-powder have long since been taught that the days are passed when powder could maintain its supreme position as the only or even the most practically useful explosive agent for industrial purposes, and that cheapness no longer contributes an all-important feature in the advantages to be claimed for it. The miner has now become critical in regard to the quality of blasting-powder supplied to him, and this has not only led to the bestowal of greater care upon the incorporation of the ingredients, and upon their quality, but has also brought about the extensive introduction of two or three forms of blasting-powder which are very decided improvements upon the ordinary black powder sold under that name.

One of these is the extra strong mining powder (E.S.M.) manufactured by Curtis & Harvey, which, in point of care bestowed upon its introduction, has much resemblance to artillery gunpowder; and the compressed powder first brought out by Messrs. Davey & Watson and manufactured by Messrs. Hall & Son, but now also produced by other manufacturers, which is at present extensively used in mining districts, and with results very satisfactory as compared with those furnished by the old blasting-powder. The perforated cylindrical form of charge, of dimensions suitable for different-sized bore-holes, was first applied, in connection with compressed gun-cotton, about sixteen years ago, and was found to present advantages independent of the nature of the explosive agent. The compact cylindrical masses of the material are convenient to pack, transport, and handle, while the conversion of the substance into a homogeneous mass of considerable density, solid throughout, except that a fuse-hole passes through the center, considerably reduces the space which it occupies in a blast-hole. Hence the effective action of the charge is increased, partly by an increase of the space available for tamping, and partly by a concentration of the action toward the base of the hole, where it is desirable that the maximum amount of work should be performed. More than one offspring of compressed gun-cotton has been similarly applied in mining industry. . . .

Although very few of the substitutes for blasting-powder which had entered the lists against it twelve years ago and upward, and which are more or less analogous to the old black powder in their composition, survived the experimental stage, one or other explosive preparation of this class still comes to the front from time to time, its claim to originality consisting generally in the novelty of its fancy designation or in the addition, to the ordinary powder constituents or to slight modifications of them, of some ingredients possessing mysterious functions, known only to the inventor and unfathomable by the chemist. Thus, many years ago, a very crude kind of blasting-powder known as Kellow's, composed of spent tan impregnated with saltpeter and sprinkled with sulphur (with the addition of a very small proportion of potassium chlorate, in the strongest variety), was manufactured for a short time in the neighborhood of Plymouth. Its comparatively safe character received practical demonstration by the factory being twice burnt without the occurrence of an explosion. That it failed to compete with common blasting-powder, even as made twenty-five years ago, need hardly be stated. However, from time to time I have met again with my old acquaintance (though sometimes sawdust had been substituted for the tan) under a new alias, such as pyrolythe or pudrolithe, or espir powder, and each time it has been re-endowed, by the re-inventors, with properties more remarkable, in point of safety and great explosive force, than it possessed before. Now the addition of a little lampblack, and of that very original ingredient of an explosive mixture, ferrous sulphate, have imparted to it fresh features of novelty and virtue, and it appears before the world as the patent safety blasting-powder, under which name it is warranted to explode only when desired, and without the development of any noxious gases or vapors whatever.

Among the more legitimate novelties in the way of blasting-powders are those recently patented by Professor Himly, of Kiel, in which sulphur is absent, and which consist of mixtures of solid hydrocarbons, such as the paraffines, or of pitch, with saltpeter, and a proportion of potassium chlorate, crude benzol, which acts as a solvent of the hydrocarbon or pitch, being used as the means of mixing it intimately with the oxidizing agents. Facility and safety of manufacture, freedom from hygroscopic properties, and superiority in point of force, are among the chief advantages claimed for these preparations, and there appears good reason why these should be realized, while, with the adoption of efficient arrangements for the recovery of the solvent, their economical manufacture should not present any practical difficulties. It may be interesting to refer to the fact that, about twenty years ago, when the subject of the improvement of time-fuses was under consideration, and their construction for use with the then new breech-loading Armstrong gun presented difficulties in respect to the fuse composition from the deteriorating action of atmospheric moisture, it occurred to me to incorporate explosive mixtures with India rubber, with the aid of benzol, whereby plastic or pliable sheets of regularly and more or less quickly burning fuse composition were obtained which were altogether free from hygroscopic properties. . . .

The circumstance that compressed gun-cotton *per se* tends, upon explosion, even in thoroughly sound and well-tamped blast-holes, to vitiate the air in underground workings and badly-ventilated places much more injuriously than nitro-glycerine preparations, on account of the somewhat considerable proportion of carbonic oxide evolved from it, constitutes one important reason why it should not find favor as a blasting agent. The same objection does not apply to compressed mixtures of finely-divided gun-cotton with the proper proportion of a nitrate, and the results of extensive experiments, made under my direction ten or twelve years ago, established the value of such preparations as mining and blasting agents. Nitrated gun-cotton, for the nitration of which barium nitrate has been selected, for reasons which I need not discuss here, finds a somewhat extensive sale now in some mining districts, and, I believe, in the colonies. As the term "nitrated gun-cotton" would scarcely have given an air of novelty to this preparation, it was introduced to the mining world some years ago under the name of tonite, and more recently under the designation potentite. . . .

Dynamite has now been so long in extensive use that its properties are familiar to all who have paid any attention to the application of explosives. In point of convenience, its plasticity gives it decided advantages over rigid cartridges, like compressed powder or gun-cotton, or tonite, on account of the greater facility of loading blast-holes with it, while, in point of power, kieselguhr dynamite, containing 75 per cent of nitro-glycerine, is, in most kinds of work, about equal to pure compressed gun-cotton. In the open air, its detonation is a little sharper than that of the latter. In experiments with long trains (continuous and spaced) of compressed gun-cotton, dry and wet, and of dynamite, which I made some

years ago, with the aid of Captain Noble's chronoscope, I found that detonation was transmitted by dry compressed gun-cotton at the rate of between 17,000 feet and 18,000 feet per second, by wet gun-cotton at between 19,300 feet and 19,900 feet per second, and by Nobel's kieselguhr (No. 1) dynamite at the rate of 20,000 feet to 24,000 feet per second. Mr. McRoberts, the talented director of the dynamite works at Ardeer, states that a ton of dynamite cartridges of the usual size (¾ inch-diameter), laid out in a line end to end, would extend one mile. According to the foregoing results, this train of cartridges would be entirely exploded in one fourth of a second if detonated at one extremity. . . .

Blasting gelatine, in its most perfect form, is translucent, of a pale yellowish color, and sufficiently firm to enable a cartridge to retain its cylindrical shape if kept lying on a flat surface. It does not soil the fingers, and the components are very difficult indeed to separate, even through the agency of a solvent of both and attempted precipitation of the nitro-cotton. Of the first sample which I received from Nobel's Explosives Company, I placed a portion in water, and have kept immersed for three and a half years. After a time, it lost its translucency—first superficially, and gradually throughout. A very small proportion of nitro-glycerine passed into solution in the water, and the mass, at the end of three years, had increased about 10 per cent in weight. Part of the sample was removed from the water, and at once placed in the cylindrical cavity of one of the leaden proof cylinders which I use for obtaining a strict comparison of the force exerted by different explosives. It was readily detonated, and, compared with a corresponding amount of a fresh sample of gelatine, the force exerted was only slightly inferior. A weighed portion of the sample exposed to the air very gradually regains its translucency in parting with the small amount of water which it has absorbed. Blasting gelatine varies somewhat in the readiness with which it is detonated. As a rule, it is not so sensitive as dynamite, but no difficulty is experienced in effecting its explosions with ordinary detonators, unless a considerably larger proportion than usual of nitro-cotton has been used in its manufacture. It is rendered extremely non-sensitive by incorporating with it a small proportion of camphor or other solid carbo-hydrogen; and this addition was contemplated by the Austrian military officials (who have adopted the gelatine for field service purposes), in order to insure its safety from explosion by the penetration of transport-wagons containing it by rifle-bullets, which in its ordinary condition it is somewhat liable to, though not nearly to the same extent as dynamite. The great proneness of the camphor mixture to escape complete explosion, even when strongly confined, led to the abandonment of this idea. The chief point needing attention in the manufacture of blasting gelatine is the character of the nitro-cotton. If the latter contain an excessive quantity of collodion-cotton on the one hand, or of trinitro-cellulose on the other, a portion of the nitro-glycerine, or rather, a liquid mixture of that substance with a very small proportion of nitro-cotton, is liable to separate after some time, and is then not unlikely to be a source of danger.

When it is remembered that two molecules of nitro-glycerine contain an atom of oxygen above the amount needed for the complete oxidation of the carbon and hydrogen, while the small proportion of nitro-cotton incorporated in the gelatine requires an additional supply of oxygen for its complete oxidation, and that the entire substance is converted into gases and vapor of water, it will be admitted, I believe, that a chemically more perfect explosive is very difficult to conceive, while, in regard to its physical properties, it certainly leaves very little to be desired. It is therefore not surprising that blasting gelatine should make rapid strides in the favor of mining communities, or that it should bid fair gradually to displace dynamite in many of its applications. In Austria, the latter appears to have been entirely superseded by it, and it is already extensively used in many other countries, while in Great Britain a temporary check in the manufacture has already been felt a serious inconvenience. The rapid and continuous growth of the dynamite industry during the past sixteen years is demonstrated by the following statement of the annual sales from factories in different parts of the world with which Mr. Nobel is associated:

| | Tons. | | Tons. |
|---|---|---|---|
| 1867 | 11 | 1875 | 3,500 |
| 1868 | 78 | 1876 | 4,300 |
| 1869 | 184 | 1877 | 5,500 |
| 1870 | 424 | 1878 | 6,200 |
| 1871 | 785 | 1879 | 7,000 |
| 1872 | 1,350 | 1880 | 7,500 |
| 1873 | 2,050 | 1881 | 8,500 |
| 1874 | 3,120 | 1882 | 9,500 |

Besides the factories included in this statement, there are several others on the continent, where considerable quantities of dynamite and similar preparations are manufactured, and the patent rights in this country having expired the year before last, two or three extensive factories are entering into competition with the works at Ardeer, which, notwithstanding this, and the importations that have taken place, have been doubled in extent during the past year. A sharp line can not be drawn between the character and effects of the two great classes of mining explosives whose history I have been discussing, namely, the cleaving and displacing agents represented by the old black powder and analogous preparations, and the rending and shattering scattering the fragments to great distances. Successful results were subsequently obtained with a powder composed of saltpeter and ammonium picrate, which, under the name of picric powder, I devised thirteen years ago, for use in shells (it being prepared in France contemporaneously by M. Boutiny). This powder proved to be even somewhat less sensitive than ordinary gunpowder, and there was a tendency to some portion of the charge escaping ignition when the shell burst. The satisfactory results obtained shortly afterward with shells charged with wet gun-cotton led to the abandonment of experiments with picric powder, which is, however, about to be taken up abroad.

---

A substance resembling anthracite coal has been brought to Hailey, Idaho, to be tested. The specimens came from a deposit twenty feet wide at the head of Trail Creek, about twenty-three miles northeast of Hailey. The deposit lies flat, under a big sandstone reef, and can be raced on the surface for over 1500 feet. It is undergoing a thorough est; and if found to be good coal, a company will take hold of the eposit and open it up for household and smelting use.

## THE CUMMER ENGINE.

It is a gratifying evidence of the fact that economy is more closely studied in many branches of manufacturing and mining, that a better type of engines is beginning to find more general use. In the textile and other leading industries, progress in this direction has been rapid and well sustained for years; but it must be confessed that in our mines, and to a less extent in our rolling-mills and other metallurgical establishments, attention has been paid to the subject of economy of fuel only during the past decade. To a certain extent, this hesitation on the part of managers to adopt modern engines has been justified by the plea that it would not do to place a delicate mechanism where it could not get proper care, and that it was less uneconomical to waste fuel than to run up heavy bills for repairs and be subject to the annoyances and losses that frequent stoppages would entail. Experience has shown that many of the drawbacks have been overrated or have been met by more recent designs of engines, and the close margins under which works have been forced to run for long periods have taught the necessity of carefully studying economy in many departments hitherto neglected. To those in charge of such works is assigned the duty, and we believe most of them recognize it, of carefully watching progress; and there is therefore a more general disposition to look into the record and examine the claims of the growing number of engines of modern design which are now in the market. Among those engines which have, during the past few years, attracted considerable attention is the Cummer engine, first in the West, its home, and now in the East. We had occasion, some weeks since, to visit the well-appointed new shops of the Cummer Engine Company, at Cleveland, and to watch the methods adopted for building the engine, as well as to note its performance. A description of its principal features, and a presentation of the reasons for which details in the design and in the construction of parts were chosen, are its best advocates to attention. We need only add that we have been much impressed with the system adopted at the works to carry out the intentions of the designer.

The Cummer engine is an automatic cut-off engine, and therefore possesses the advantage common to the engines of this class of avoiding wire-drawing, using steam of higher pressure and admitting of closer regulation of the speed. As distinguished from the type of releasing automatic cut-off engines, of which the Corliss engine is the most prominent and successful example, the Cummer engine does away with the system of cams, springs, and tappets. The Cummer engine belongs to that class in which the valve, being at all times connected with the governor, has a positive motion. The cut-off is varied by shifting the eccentric around the shaft so as to change its angularity, and thus change the point of closure of the valve. This is effected through suitable mechanism by the movements of weights revolving in a vertical plane, their centrifugal force being kept in control by being made to lift a dead weight. Fig. 3 shows a vertical section through the center of the governor, and its parts—the plan, Fig. 2, also showing a horizontal section. The cut-off eccentric, with its sleeve, fits loosely on the governor-shaft, and, as shown in Fig. 4, is connected with the flying ends of the governor weights by means of rods or links in such a manner that the cut-off eccentric, with its sleeve, is moved around the governor-shaft, either forward or backward, as the flying weights change their position. Thus the steam is cut off correspondingly, earlier or later in the stroke, as the governor or flying weights adjust themselves to the load. As shown in Fig. 2, the horizontal plan of the engine, the governor-shaft is driven from the main shaft by a train of gears. It is hollow, as shown in Fig. 3, and through it passes a thrust-rod. One end of the latter is attached to a cross-bar which, passing through a slot in the governor-shaft, is made to revolve with it. This cross-bar is, as shown in Figs. 3 and 4, connected with the flying weights by bell-cranks and rods. The other end of the thrust-rod which passes through the hollow governor-shaft fits into a step which is jointed to the vertical arm of the large bell-crank shown in Fig. 3. Any movement of the weights in the governor case causes the thrust-rod to move correspondingly out or in, and thus raises or lowers the weight located under the engine, and through the rods and clamp-collar shifts the eccentric around the shaft in either direction, cutting off earlier or later as the case may be. The balancing of the centrifugal force of the flying weights of the governor by the constant centripetal force of the hanging weights would be perfect for the speed for which the governor is adjusted. An increase or decrease in the speed is taken care of by the spring shown in Fig. 3, the duty of which, however, is very light; this spring is adjustable by having its point of attachment shifted. The tension of the spring increases as the flying weights move outward, so that, when any change of speed occurs, the steam is cut off proportionately to the load, thus making the governor very sensitive within a wide range, without having the drawback of the changes which springs doing the whole of the duty undergo. By placing the governor on its own shaft, its diameter, and with it the size and friction of the eccentric and eccentric sleeves, may be reduced, and offset rods and offset rocker-arms be avoided. With small shafts, too, the points of attachment for the rods connecting the clamp-collar with eccentric sleeve with the governor weights may be brought much nearer the center of its shaft than would be possible if the eccentric sleeve was placed on the main shaft. For a given angular movement, the eccentric on a separate shaft need move through an arc only from one third to one fourth as large, and consequently a slight movement of the weights makes a much greater change in the point of cut-off and renders the governor more sensitive.

The main eccentric is, as shown in Figs. 2 and 4, attached to the end of the governor-shaft directly. It operates the main valves and then the exhaust-valves through the intervention of a rocker-arm. With the object of avoiding the derangement of the exhaust due to the use of the common D valve under same conditions, the Cummer Engine Company has adopted a separate steam and exhaust-valve, each with its own chest-ports and exhaust passage. They are operated from one eccentric and have each the same travel, while the cut-off valve slides upon the back of the main steam valve. In order to reduce the throw of the valves, and to use much smaller eccentrics, the "grid-iron" form of valve, shown in Figs. 5 and 6, has been adopted. Fig. 5 shows the main valve in plan and section; and Fig. 6, the cut-off; there being three openings in the former, while the latter admits steam from one of its outside edges and from corresponding inner edges of its two openings. The exhaust-valve

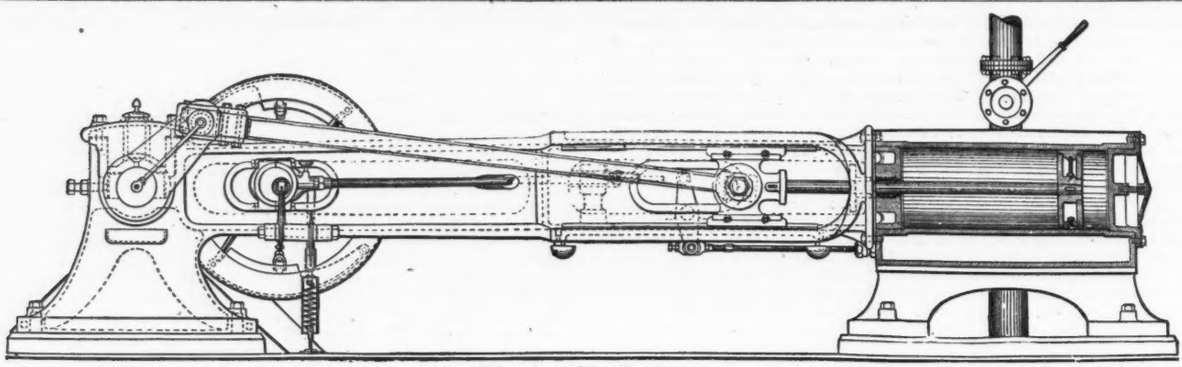


Fig. 1.—Side Elevation.

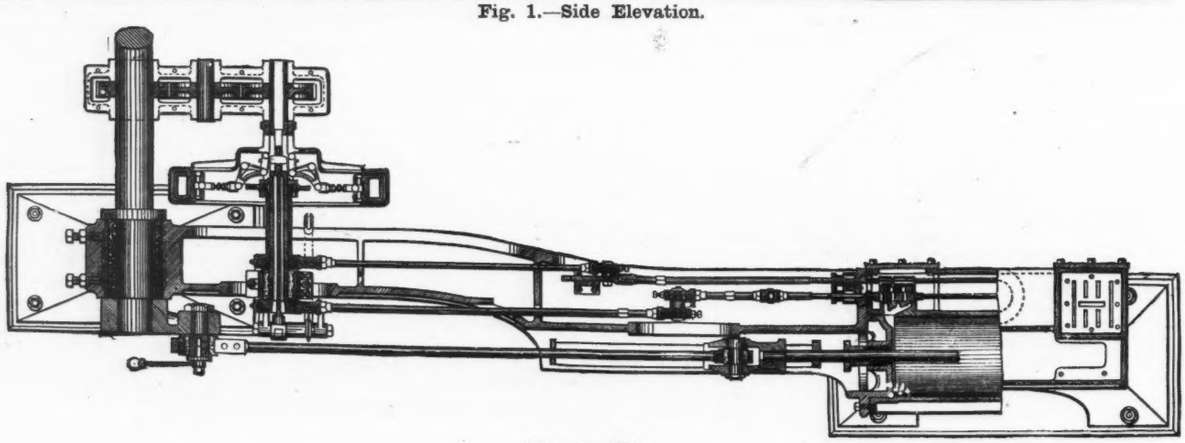


Fig. 2.—Plan.

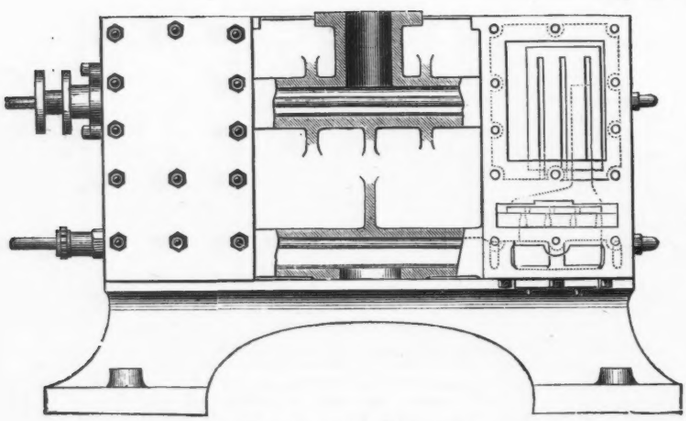


Fig. 7.—Elevation of Cylinder.

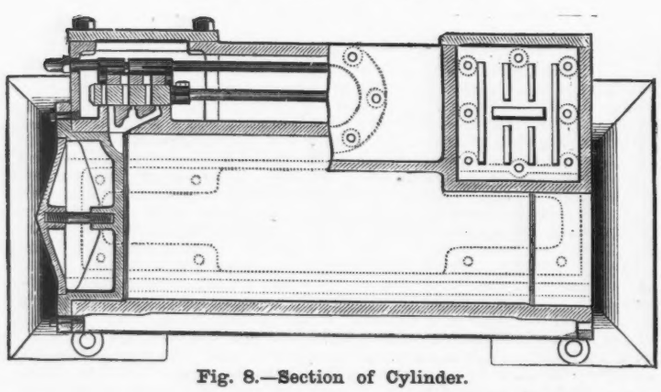


Fig. 8.—Section of Cylinder.

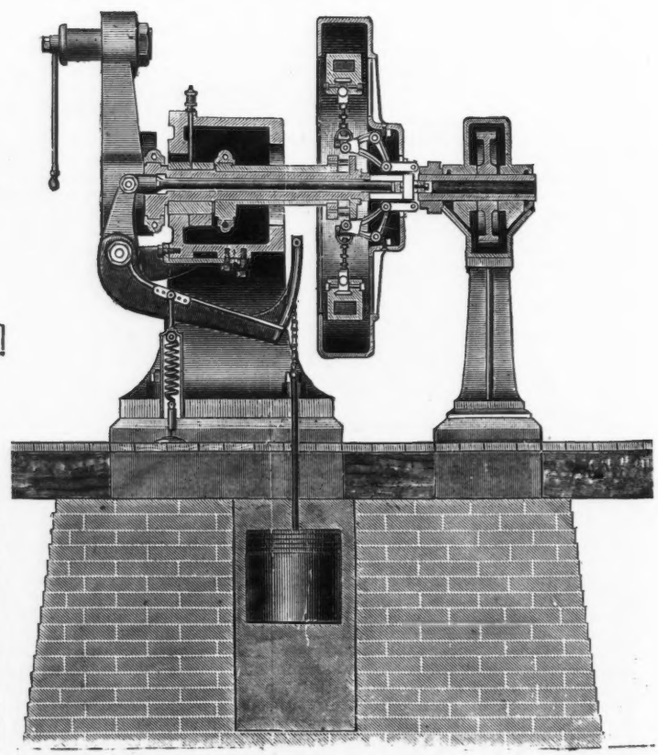


Fig. 3.—The Governor.

## THE CUMMER AUTOMATIC CUT-OFF ENGINE.

has three openings, but, as one of its outside edges admits steam also, there are four ports in its valve-seat.

Fig. 7 shows an elevation, Fig. 8 a longitudinal section, and Fig. 9 a cross-section of the cylinder, in which appear the general features and arrangements of parts. The elevation shows in part-section the steam passage with a short length of pipe, and below it the exhaust passage. On each side, are the steam and exhaust-chests; that on the right has the cover removed, showing steam and exhaust-valves. The valve-stems are also shown; they pass through the steam and exhaust passages, and connect the valves at one end with those at the other. Fig. 9 is a cross-section through the cylinder and its base; the plane of section being through the valve-chest, shows the steam-valve with its cut-off, and

underneath them the exhaust-valve sliding in a horizontal plane. The exhaust-valve seat is made removable, for greater convenience of construction and to allow for refacing. Below the exhaust-valve is seen the exhaust passage, and there is also shown the means by which the valve is moved; this consists of a clamp-collar which fits the valve-stem and is provided with a prong coming up through a slot in the valve-seat and attached to the valve. One half of the horizontal section, Fig. 8, shows the main and cut-off valves for that end with its steam passage. The other half is sectioned to show the exhaust valve-seat. In this figure and also in the cross-section, Fig. 9, we see how the steam enters the cylinder through a three-ported seat, afterward uniting to form but one opening into the cylinder, and how steam is exhausted through the lower part of this same port, which then by one large opening communicates with the chest in which the exhaust-valve is located. There is no real connection between the two, however; each valve within its own chest controls its own ports, and live steam can not enter the exhaust. In Fig. 8, there is a sectional view of one cylinder-head; this is inclosed by a conical shaped cover fitting air-tight; its surface is polished so as to look well and prevent radiation, while the air in the interior space acts as a non-conductor of heat. The head for the opposite end is formed by the inner end of the frame, which fits into the cylinder and is bolted to its flange. The cylinder itself is covered with non-conducting material, and the whole inclosed by a neat cast-iron lagging.

The piston is made large enough to give ample wearing surface, and with sufficient weight and careful distribution of metal to secure strength, no extra weight being given for any other purpose. The piston consists of three parts: the piston proper, to which is fitted the tapered end of the piston-rod secured by a cotter; the chunk-ring; and the follower. These parts are all clearly shown in the section. The plan exhibits the piston with its follower removed, but showing in section the four bolts which hold it in place when connected. It will be noticed that the piston itself and also the follower are made considerably smaller than the cylinder, and that the chunk-ring is external to these, and forms the bearing surface. The chunk-ring is turned up so as to be an accurate fit, and is then adjusted so as to be perfectly central by means of four stud-bolts, which appear in the plan and section; their outer ends have a conical point which bears against the chunk-ring, while the other ends are tapped into the boss of the piston and are provided with jam-nuts. The center of the chunk-ring is grooved, to receive the cast-iron piston-ring, which is pressed outward by several small spiral springs spaced around the circumference. The positions of these springs appear in the plan, and one of them is shown in the section. An additional packing is provided by turning two small grooves in the chunk-ring on each side of the central piston-ring. The advantage of using a chunk-ring is, that a very exact fit can be made, and, by using the central adjustment, perfect alignment can be secured. A greater wearing surface for the same thickness of piston is obtained, because the chunk-ring is the same width as the piston itself and bears over its whole surface, whereas, in the ordinary form, a part of the piston, and the follower also, are turned down below size and do not bear at all. By this arrangement also, whenever, after long wear, it becomes necessary to rebore the cylinder, it is only necessary to turn up a new chunk-ring instead of fitting up a whole new piston.

In the vertical section, Fig. 2, is shown the form of cylinder-head adopted by the Cummer Engine Company. It projects within the cylinder, and is designed to reduce clearance to as low an amount as possible. The forward head, as shown in the engraving, is formed by the end of the girder frame, but, in the company's present practice, the head is made separate and bolted to the frame. Objections have been made against this deep form of cylinder-head, on the ground that the annular space between the head and counter-bore affords so much more condensing surface than the ordinary form of cylinder-head; but, in point of fact, this objection does not hold at all, because the cylinder-heads are made a true fit for an inch or so at the outside bearing and an easy sliding fit for the rest of the length. The space between the counter-bore and head, which is about the thickness of a piece of paper, becomes, when in use, completely filled up with a deposit from the oil used to lubricate the cylinder, which is driven in by the steam, and, as experience has shown, effectually prevents any condensation from this cause.

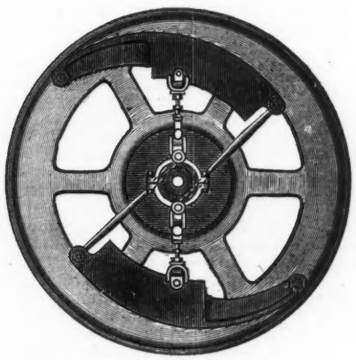
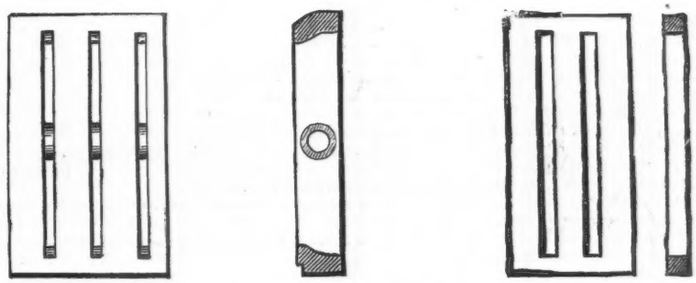


Fig. 4.—Governor.



Figs. 5 and 6.—Valves.

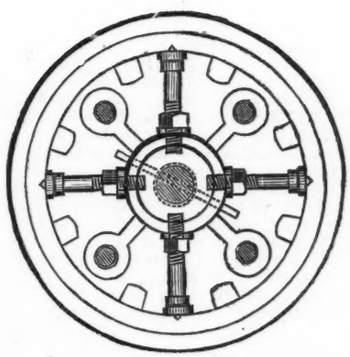
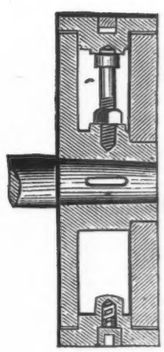


Fig. 10.—Piston.



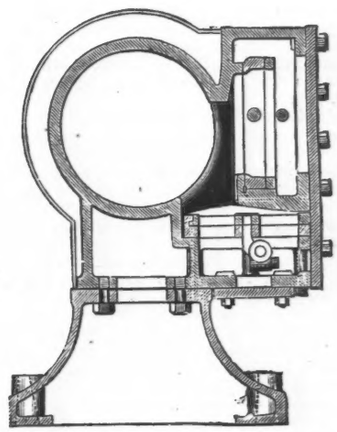


Fig. 9.—Cross-Section of Cylinder.

## THE CUMMER AUTOMATIC CUT-OFF ENGINE.

DRIVING MACHINERY BY SAND.—A Western exchange gives an interesting account of the method recently adopted by Mr. J. Townsend, of Virginia City, to run a number of arrastras by sand. The arrastras are placed in a light sandy field where only sufficient water for drinking purposes and to moisten the ore to be operated upon can be obtained. The sand drives a large overshot wheel, taking the place of water. It was at first Mr. Townsend's intention to run the arrastras by means of a large windmill; but as the speed was naturally irregular, he adopted the present method. The windmill now runs a belt containing a number of buckets, and these carry sand up to a large tank somewhat in the way that grain elevators carry wheat. A stream of sand being let out upon the overshot wheel, causes it to revolve, just as it would under the weight of a stream of water, and thus far the method is said to have been found very successful. When there is a considerable wind, sand is stored up for use when calms prevail, and in this manner the mill may run continuously.

## THE MINING AND METALLURGY OF ZINC IN THE UNITED STATES.*

By F. L. Clerc.

(*Continued from page* 151.)

### EASTERN ZINC-WORKS.

*Spelter Furnaces.*—The reduction-works at Newark, Jersey City, Bergen Point, and Bethlehem employ the same general type of furnace, adapted to the use of anthracite coal. They all manufacture oxide of zinc as well as spelter. None of them can produce metal as cheaply as any of the Western works; but they all produce a brand of metal very free from lead, which commands a continued sale. The furnace used differs from the ordinary Belgian furnace chiefly in the substitution of a shallow ash-pit from 16 to 18 inches deep, with luted ash-doors, into which a blast of air is admitted under the fire, in place of the high underground ash-pits and tunnels of the latter. The grate is composed of flat perforated bars of cast-iron, placed close together, so as to permit the use of pea coal. The method of cleaning the fire is as follows: At the back end of the grate, and on a level with it, there is a flat ledge of fire-brick; the live coals from the top of the fire are pushed back on to this ledge, the cinders are barred up from the grate and scraped out at the fire-door; the fire is then drawn forward and spread over the cleaned bars, fresh coal is thrown in, and the blast is admitted, and in a very short time the furnace is brought to the required heat. By means of the blast and chimney-dampers, the fire is easily controlled, and the heat is regulated to suit the requirements of the different operations of smelting. Furnaces of fifty-six retorts are in general use. Nothing seems to be gained by any considerable increase in the number. If the furnace is charged twice in twenty-four hours, which is the usual practice, this is about as many as can be attended to properly by three men—one charger and one long-shift and one short-shift man; for if the operation of cleaning and charging is prolonged, the time left for reduction becomes too short to properly exhaust the charge. If the furnace is enlarged so as to employ two more men, the work of firing becomes excessive if there is only one fireplace; if there is a fireplace at each end, a cross-wall between them adds little to the cost of construction, but it greatly strengthens the block and facilitates repairs; but at the same time it divides the block into four furnaces. Anthracite coal, with a blast, gives a good flame and sufficient heat in all parts of the furnace. It is customary to protect the lower retorts from the radiated heat of the fire by a row of thick tubes, called cannons, about the same size as the retorts, but open at both ends. Where the furnace is charged only once in twenty-four hours, much time is lost, during which part of the furnace is not working; and the lower retorts are too long exposed to a strong heat under circumstances which make it very destructive to them. It may also be considered as proved that any considerable departure from the long-established dimensions of the retorts—from 6½ to 7 inches internal diameter—is a mistake where the furnace is charged twice in twenty-four hours and the ore is sufficiently valuable to make close working desirable. It is worthy of note that the workmen everywhere desire larger retorts and twenty-four-hour charges, for the simple reason that their active working hours are reduced at the same time that the amount of metal on which they are paid premium is increased.

*Oxide Furnaces.*—The oxide furnaces in use are also of the same general type. Each furnace has a rectangular horizontal cross-section, about 8½ feet wide by 6 feet deep, and is covered by a full center arch; 8 or 10 inches below the spring line of the arch is the grate, which is formed of flat cast-iron bars, 6 feet long, 6 inches broad, and an inch thick, perforated by tapering holes, one inch diameter below and one quarter inch diameter at the top, set as closely together as the strength and stiffness of the iron will permit; these bars lie close together, and rest on three or four bearers set crosswise into the side-walls of the furnace. Below the grate is an ash-pit from 18 to 20 inches deep, closed in front by iron doors. The opening into the furnace is under an arch in the front wall; this doorway is sometimes closed by iron doors, but the simplest and best method of closing it is with a bank of moistened ashes piled up against it; for this purpose, a shelf about 20 inches broad projects in front of the furnace on a level with the grate-bars. The front opening is usually a semicircular arch the full width of the furnace. The ash-pit is connected with an air-flue coming from centrifugal fans, and provided with a damper, by which the blast is regulated. There is an opening in the arch of the furnace for the escape of the zinc oxide and other products of combustion; this opening either leads directly into the iron or brick flue running to the cooling apparatus, or into a short flue, from which the gases may be turned either into the oxide flue or into an open chimney, according to which of the two systems of working is adopted. It is customary to place two such furnaces end to end, and work them from opposite sides; and the end wall between them is sometimes omitted, a single opening through the arch answering for both furnaces. A row of such pairs of furnaces side by side is built, and the same air and oxide flue answers for the row.

The method of working the furnaces is as follows: One man attends to four or six adjoining furnaces, and charges them alternately, one every hour. When opposite furnaces open into each other, these two furnaces are charged at the same time. When the time comes for cleaning out a furnace, the draught is shut off, the pile of ashes is removed from the front of the furnace and thrown to one side, to be used again. What is left in the furnace from the preceding charge is in the form of a more or less solid clinker, covering the whole surface of the grate: this is loosened and broken up with suitable bars, and is drawn out in front of the furnace. The bed coal is thrown in on the cleaned grate, and spread evenly in a layer of about an inch deep, the front opening is partly closed with a loose piece of sheet-iron, and a little air is admitted through the ash-pit; the cinders and ashes of the preceding charge are thrown out of the way of the workman, and, by the time this is done, the bed coal has been sufficiently ignited from the heat retained in the sides and arch of the furnace to receive the charge. This consists of a mixture of crushed ore, with about half its weight of anthracite coal, as finely crushed as can be used without falling through the grate. The charge is spread over the fire and leveled carefully; the front of the furnace is closed with its bank of ashes, and more blast is let on. A charge remains in the furnace from four to six hours, according to the practice at different works. When the ore used is calamine, smithsonite, or franklinite, it is charged raw; when it is blende, it must be very carefully roasted beforehand. When franklinite is used, the hard clinkers remaining in the furnace are reserved for the manufacture of spiegeleisen, and are called the "residuum." The fine residues of the charge are mixed in with the succeeding charge; by this means, the fire is kept open for a longer time for the penetration of the blast, and a thick crust of residuum is obtained, more suitable for treatment in a blast-furnace. The ashes are removed from below the grate only once in twenty-four hours, and the charge is in all cases slightly moistened before being thrown into the furnace. As the charges are made alternately every hour, the heat in the conduits and all parts of the apparatus is kept very uniform, and sufficient to instantly burn any particles of coal drawn over with the gases, and no trouble is experienced from their effect on the oxide. The practice of some works in only turning the gases into the oxide flue when the zinc flame makes its appearance, seems an unnecessary precaution. An excess of air is always admitted, so that it is probably the active agent in ozidizing the zinc, and very little carbonic oxide would be found in the bag-room. It is very important that the men should watch the working of the furnace carefully, and by regulating the admission of the air, and by closing all blow-holes with a rake, should force the air to pass through the charge as uniformly as possible.

The apparatus for cooling the gases and oxide varies considerably in different works, but consists essentially in some combination of brick or iron flues, with towers or ascending pipes, with or without sheets or jets of water and steam-chambers. Beyond it are exhaust-fans, to draw the gases carrying the oxide from the furnace and send them through settling-chambers to the bag-rooms. The gases, now cooled and carrying only light flakes of merchantable oxide, are distributed through the bag-rooms by iron branch pipes, along the tops or the bottoms of which are set rows of nipples close together, to which are attached cotton bags. These bags are often 40 or 50 feet long, and hang down from the branch pipes or are suspended vertically above them from the roof. Two hundred square feet of bag surface to one square foot of grate surface is a proportion found to work very well in practice. The bags are about two feet in diameter, and, when suspended from the branch pipes, the lower ends need not be closed if tney are long enough to be given a half-twist and rest on the floor or on a slightly raised bench under them. An ingenious variation of this arrangement may be seen in the works of the Lone Elm Company, at Joplin, Missouri, for the collection of the white fumes from the lead slag eyes. There the lower ends of the bags are tied to nipples in the top of closed bins, into which the collected fume may be directly shaken, and from which it may be packed, when the lower ends of the bags are closed by a sliding gate. The bags thus form the only outlet from the furnaces. The cooled gases pass freely through the meshes of the cotton, and the finest flakes of oxide are arrested on the inside. These must be shaken down from time to time, to keep the meshes open and to collect the oxide in the bottom of the bags. When the oxide, after collection, is kiln-dried to drive off one or two per cent of moisture absorbed from the furnace gases, and bolted to remove cotton fibers and occasional specks of iron-rust and lumps of hardened oxide detached from the pipes, its quality is certainly improved, and it will keep better without caking; but this is not always considered necessary. As collected, the oxide is too light and feathery to be directly packed, and must be compressed by suitable machinery.

This oxide process is not new, and is generally well known, but it is probably the only valuable contribution America has made to the metallurgy of zinc. Its operations, though very simple, are not without their difficulties. Very slight and often not very obvious causes suddenly affect the color or body of the oxide; different ores require different treatment, and the heat conditions and amount of air admitted at different points of the apparatus seem to have almost as decided an effect on the quality of the oxide as has the character of the ore treated: all of the volatile constituents of the ore will be found in the oxide. Besides containing traces of sulphur, arsenic, antimony, and cadmium, commercial oxide frequently contains minute but weighable amounts of lead, iron, manganese, lime, magnesia, and ash, which often do not seriously affect its color. If the color is good, a small percentage of lead is supposed to add to the body of an oxide. There is good reason to infer that the unnatural color imparted to an oxide by these elements depends much less on the actual amount of them which it contains than upon the nature of the compounds into which they enter, some of these compounds being white, others possessing more or less coloring properties. Conditions of volatilization, oxidation, and condensation, therefore, strongly determine the color of the resulting oxide. Color being a purely physical property, it is also probable that, apart from the effect of extraneous coloring substances, the color of an oxide depends also on its physical texture, and sometimes results solely from physical causes. There must be a certain proportion between the volume of gas, the amount of oxide carried by, and the dimensions of the flues. Apparatus that will work very well with certain ores, or with a certain number of feet of grate surface, will not give equally good results with richer or poorer ores, or with more or less grate surface. In working some ores, it is necessary to run as hot as is consistent with safety to the different portions of the apparatus; with others, the best results are obtained by running cold. It is well to start with sufficient cross-section of flues, and with a reserve of power in blast and exhaust-fans, and with large cooling and settling-chambers, and numerous doors for cleaning them and admitting air. Water in the ash-pits is in some cases found to be very useful in protecting the grate-bars and equalizing the temperature. Considerable control can always be had over the heat by varying the weight either of coal or ore in the charge; both must also be regulated to suit the time the charge is to remain in the furnace. Lime or limestone is often added to the charge, and acts sometimes chemically in liberating the zinc from its combination with silica; at other times, it is added to stiffen the charge and prevent it from running through or stopping up the grate-bars.

In the works at Jersey City, Newark, and Bethlehem, franklinite is now exclusively used for the manufacture of oxide, and the residuums are treated for the extraction of the iron and manganese in small cupola

* From advance-sheets of *The Mineral Resources of the United States*, published by the United States Geological Survey, Department of Industrial Statistics. Albert Williams, Jr., Chief of Department.

furnaces, about 20 feet high above the tuyeres, and 6 feet wide above the boshes. Nearly all of the iron is obtained, but little more than half of the manganese. The operation is beset with many difficulties. The 3 or 4 per cent of zinc oxide left in the residuum is very troublesome, and has heretofore prevented the use of large furnaces. The pipes for collecting the fumes from the tunnel-head require cleaning two or three times a week, and during the cleaning the furnace cools down and manganese goes into the slag; the spiegeleisen drops suddenly from as high as 23 per cent often below 10 per cent of manganese, and eight or ten hours are required to bring the furnace back again to its proper working condition. If the manganese could be got into the pig to the same extent as the iron is utilized, a ferro-manganese of 33 per cent could be obtained.

The fumes collected from the spiegel furnaces and the impure oxide obtained from the flues and sweepings of the oxide-works are usually made into metal in the ordinary spelter furnaces, but the latter is sometimes converted into good oxide by reburning.

(TO BE CONTINUED.)

## MISTAKES IN MINING.

Written for the Engineering and Mining Journal by George C. Tilden, C.E.

While spending the summer vacation in Clear Creek County, Colorado, the writer noticed that it was unusually quiet, and although the usual quantity and quality of mineral were sold to the sampling-works at an unusually high rate, there was a lack of activity as far as concerned investments. There were but few new mines worked, and some of the old ones, which have been and are still capable of producing large quantities of ore and at fair profit, if properly managed, were idle. As a cause of this, it was suggested that Clear Creek County had lost favor with Eastern capitalists, because it had not done what they expected it would. If the mines of this county can not influence capital, it is not caused by any want of value on the part of the mines, but through mistakes made by the capitalists themselves. To call attention to a few of these mistakes, without reference to the mines at which they were made, will not be out of place.

It is a mistake to believe that a vein is a continuous ore-body that will always carry ore, and that the assay value of the ore will increase as depth is attained. It is a mistake to believe this, and provide no capital for development. It is a mistake to expect from a mine, when once opened up, more than a fair percentage of profit on a fair valuation. It is a mistake to judge of the value of a mine, or even of a stope, from specimen assays. It is a mistake to accept the opinion of a young mining engineer, fresh from some Eastern mining college, in regard to a mining or milling investment. The young man in taking charge of the property obtains considerable valuable information and experience; but his company unfortunately has to pay for it.

The above is written with no intention to disparage graduates of institutions of technical training, but to imply that theory in mining is useful only in so far as the mining engineer is capable of combining it with practice. We have had altogether too much of the theoretical man in Colorado. He has made the greatest number of mistakes. He comes here intrusted with business important both to the reputation of our State and to the interest he represents. All theory—no practice—no business education. He thinks mine management a profession. It is a business as well. Ground is to be let. This requires a knowledge of its value per foot or fathom for breaking, and the royalty it can command. Contracts are to be made. Rents are to be determined, and other business to be transacted. Mineralogical, geological, or any technical training, although of great value, is not all that is required. The manager of a mining property must have a business knowledge of mining. Surely the man of theory has left his mark in Clear Creek County.

It is a mistake to sink a perpendicular shaft and drive a cross-cut to work the veins of Clear Creek County, when in every case an incline would be less expensive and answer the purpose as well. It is a mistake to drive a cross-cut tunnel fifteen hundred feet, at an expense of at least twenty-five dollars per foot, and not secure a title to a single vein that it will intersect. It is a mistake to work the mines of Clear Creek County by any other than the "tribute system." It is a mistake to build tramways, concentrating or stamp-mills when there is only a prospect of obtaining ore. It is a mistake to build a plant to treat ore by some new "ten dollar a ton and save ninty-nine per cent of the assay value" process, without first making a thorough but comparatively inexpensive inquiry into the chemical and mechanical laws upon which the new idea is based. It is a mistake to run a mine in debt and then expect to pay up by allowing the tributers to produce the greatest quantity of mineral in the shortest space of time by gouging and understoping. It is a mistake not to keep the development-work of a mine in advance of the work of extraction. In Clear Creek County, it is a mistake not to open up at least five fathoms of ground for every fathom stoped. It is a mistake to build a forty thousand dollar mill on property that belongs to some outside party who, after completion, will give a lease for only a year. It is a mistake to think that the merchantable ore of Clear Creek County will pay the cost of transportation to a concentrator that is far remote from the mines. I fear it would be a mistake to attempt to treat the ores of Silver Plume at that place, as has been suggested by some. They do not contain enough lead for treatment in a water-jacket. They contain too much lead to waste by any process that does not secure the lead. They contain too much zinc. They are too refractory. The only advantage they possess is their grade. They command the very highest rate in Golden and Denver, when they are mixed with less refractory ores, and only by judicious mixing can they be smelted with profit. Mining in Clear Creek Creek County is profitable, but not to parties who make the mistakes I have mentioned. No enterprise can succeed where errors of equal importance occur.

THE DUTY ON ROUND IRON.—The Customs Division of the Treasury Department is in daily receipt of letters complaining of the decisions of collectors of customs with respect to the tax on round iron and wire rods. Nothing, however, will be done toward settling the dispute as to the construction of the tariff act in so far as it relates to this class of imports until after Secretary Folger returns to the department. With the object of securing the fullest information possible on the subject, Assistant-Secretary French, about two weeks ago, addressed a letter to the secretary of the Iron and Steel Association in Pennsylvania, asking for data and for his views regarding the construction of the law; but up to the present time, the desired information has not been received from the association.

TUBES AND WIRES UNDERGROUND.—The pipes for the pneumatic tube service of the Western Union Telegraph Company are laying between the building of the company at Broadway and Dey street, and the new building at Fifth avenue and Twenty-third street. Four brass tubes, each 3 inches in diameter, will be put down. In the same trench will be laid two 5-inch iron pipes for holding telegraph wires to be used in local business. The company now has 75 miles of wire underground between the main building and the Stock and Cotton Exchanges and the North River cables. The pipes are laid four feet underground, to be out of the reach of the frost. The pneumatic tubes will be in operation early in the winter. Pneumatic tubes now run to the newspaper offices, the Stock and Cotton Exchanges, the Equitable Building, and the cable offices. The new Produce Building will be connected with the main office in the same way.

THE PRODUCTION OF AUSTRIAN MINES AND SMELTING-WORKS IN 1882.—Official statistics have just been published on the production of the mines and works of Austria in 1882. The unit is, unless otherwise stated, the metric ton of 1000 kilograms:

| | 1882. | 1880. |
|---|---|---|
| *Mines.* | | |
| Coal | 6,559,002 | 5,889,631 |
| Lignite | 8,996,290 | 8,420,647 |
| Iron ore | 902,510 | 696,832 |
| Graphite ore | 15,577 | 13,718 |
| Manganese ore | 8,418 | 8,874 |
| *Smelting-Works.* | | |
| Pig-iron | 435,478 | 320,302 |
| Spelter | 4,791 | 3,756 |
| Copper | 482 | 500 |
| Lead and litharge | 11,889 | 9,235 |
| Quicksilver | 409 | 369 |
| Tin | 34 | 29 |
| Gold (kilograms) | 16·4 | 41·3 |
| Silver ( " ) | 31,095 | 30,257 |
| Antimony | 161 | 125 |
| Sulphuric acid | 12,282 | 12,234 |

## FURNACE, MILL, AND FACTORY.

Says the Philadelphia *Record:* Nine vessels loaded with Bessemer ores from Spain, each carrying from 1800 to 2000 tons, are expected to arrive at this port within the next two weeks. An old iron broker of this city, in commenting upon the fact yesterday, stated that this was an unusual occurrence. Three years ago, it would not have been considered so unusual, as the arrival of that number of ore-laden vessels in this city was a frequent occurrence. Philadelphia in those days ranked first in prominence as a port of entry for vessels with cargoes of that kind. This prominence, he contended, had been transferred to Baltimore. The reasons given for the diversion of this traffic from one city to another were numerous.

The gas-well at the Laughlin nail mill, Harper's Ferry, is going down as fast as possible.

The Benwood Iron-Works, Wheeling, have begun the work of boring for gas on their property between the mill and the Baltimore & Ohio Railroad.

An innovation in the manufacture of iron in Cleveland has been the recent introduction of Canadian ores. These hematites have been introduced into the burden of the Central Furnace of the Cleveland Rolling-Mill Company in the proportion of 25 per cent to 75 per cent of Lake Superior ores, and with very satisfactory results. The Hocking Valley coal and iron syndicate has also, we learn, arranged to give these ores a trial.

The Crozier iron furnace at Roanoke, Va., turns out one hundred tons of first-class metal per day. They use coke from Pocahontas. The ore is supplied from the Houston mines, fifteen miles distant on the Shenandoah Valley Railroad, and from the Upland mines, twelve miles distant on the Norfolk & Western Railroad.

Smethport, Pa., is to be lighted and heated with natural gas by November 1st, from the Wilcox gas-well, sixteen miles distant.

The blast-furnaces of the Joliet, Ill., Steel Company are running steadily. The converting mill and rail-mill are making 175 tons of rails at a turn, or 350 tons every twenty-four hours.

From Pittsburg, it is reported that it is proposed to start up the sixteen puddling-furnaces built a year ago at D. J. Painter & Son's mill. The puddlers at Everson & Macrum's mill are to go on double-turn. Work on Moorhead & Co.'s new open-hearth steel-furnace is pushed ahead.

The Farrell Foundry and Machine Company, at Ansonia, Conn., has added a 60 horse-power Westinghouse automatic engine to drive all its foundry work, independently of its main engine and water-wheel. It is also using a smaller one as an independent power for the blower in the forge.

The Western Nail Association held its regular quarterly meeting at Pittsburg, September 12th. Reports received from all sections indicate the trade to be satisfactory, and that plenty of orders are coming in. Stocks are reported to be very light and assortments badly broken. In view of this, it was decided not to order a stoppage of the mills, as was anticipated, but to continue them in operation until further orders. The card rate was not changed.

Reports from Niles, Ohio, state that ten of the business men of that place have incorporated the Goshen Iron Company, with the view of purchasing the interest of the Ward Iron Company in the New Philadelphia rolling-mill. The new company designs paying off the liens on the mill as soon as possible, and will avail itself of the benefits accruing from the town according to the original contract. The capital stock is $300,000.

At Chicago, on the 12th inst., the Washburn & Moen Manufacturing Company, the patentees of barbed wire, filed a bill in court to restrain the Lyman Manufacturing Company from manufacturing more than 2500 tons of barbed wire annually, according to contract. The damages for over-manufacture are laid at $100,000.

At Clinton, Mass., the Clinton Wire Cloth Company is putting in apparatus for galvanizing the wire cloth at its mills. Hitherto, this part of the work has been sent elsewhere to be done.

A conference has been arranged for the 15th, between the proprietors of the South Chicago Rolling-Mills and a committee of the striking employés. It is understood that the men are ready to resume work on the company's terms, and the general impression is, that work will be begun in two weeks.

The Mont Alto Charcoal Furnace, 9½ by 43 feet, resumed work a short time since after an idleness of three months. Fire was lighted in the furnace on Tuesday morning, August 14th, and the output during the first twenty-four hours was 5½ tons No. 2 and 8½ tons No. 1, a total of 14 tons of pig-iron. During the

second twenty-four hours, the product was 30 tons No. 1 pig on less than 100 bushels of charcoal per ton of 2268 pounds of pig-iron. Since this remarkable start, the furnace has continued to do excellent work.

The Florence, Mich., *News* states that there is some talk among the Florence mine management of building a blast-furnace at the mine at no distant day.

The Fort Scott Machine Works, Fort Scott, Kansas, have received an order for a concentrator for the works of the late Alta-Montana mine.

## GENERAL MINING NEWS.

### ARIZONA.

#### GRAHAM COUNTY.

ARIZONA COPPER COMPANY.—The furnaces have been closed down, and the work of clearing away and getting ready for the new plant of five furnaces and concentration-works has already begun. The Clifton *Clarion* says that the new plant will be built about ten feet higher than the present furnaces, on the side of the hill, which will give a good fall for the slag. The narrow-gauge railroad will be raised so as to come in about 70 feet higher up on the hillside than the furnaces, and a side-track about 40 feet below it. Large chutes will be erected to receive the ore as it is brought down from the mines, and bins and sheds will be built to contain the coke. The high-grade ore will pass from the chutes into the crushers and from there to the furnaces, and the ore of a low grade will pass into the concentration-works and then to the furnaces. A new water-power is also to be constructed. The water will be taken from the San Francisco River, and a flume 4000 feet in length, four feet deep, and seven and a half feet wide, will be built, which will furnish ample power for the new plant and also for any additional works that may be required in the future. Every advantage will be taken in constructing the new works to facilitate economical operation.

#### PIMA COUNTY.

A correspondent of the San Francisco *Exchange* says: The project of putting up reduction-works in Tucson is by no means dead. Every day shows more the need of them, and shows also that they will not only be a financial success themselves but a great advantage to the surrounding mining districts. There are many rich ledges in this vicinity which would not warrant reduction-works, but which could ship ore to Tucson and reap a large profit.

OMEGA.—This smelter will start up shortly.

PEER.—This mine is situated in the Quijotoa Mountains about eighty miles southwest of Tucson. The ledge is from 15 to 20 feet wide, and may be distinctly followed for 3000 feet, cutting through a high butte, where it displays itself clear to the bottom of the gulch. Five tons of the ore have been sent to Benson, and the owners received between $400 and $500 per ton. But little work has yet been done on the claims. The work going on now is sinking for water, the nearest water now being four miles from the mine.

#### PINAL COUNTY.

SILVER KING.—The damages made by the recent storms have been repaired and work continues as usual.

### CALIFORNIA.

#### INYO COUNTY.

LASKY MILL.—Of late, this mill, at Beveridge, has not been running very steadily, and has been crushing only fifteen hours out of the twenty-four. Since the 22d of July, it has reduced 80 tons of Keynot ore which resulted in 340 ounces of gold at $14, amounting to $4760. Twenty-one tons of ore from the True Business mine were also crushed, which yielded 75 ounces of gold, worth $15 per ounce, amounting to $1125. The works are now in steady operation, and there is plenty of ore on hand.

### COLORADO.

#### ARAPAHOE COUNTY.

EUREKA SMELTING AND REFINING COMPANY.—A small plant of machinery has been put up by this company in South Denver, where it is working ore by the new Brett process. It is claimed that by this process ore can be treated at from 90 cents to $1.15 a ton, or for $1.50 at the very highest. Three men are employed at the new works, which has a capacity of about fifty tons a day. It is understood that ground is looked for on which to erect capacious works, and that a party of capitalists is backing up the enterprise.

PUBLIC SAMPLING-WORKS.—This company, which has a plant at Black Hawk, has begun operations by erecting similar works in Denver. The works, it is estimated, will cost $25,000.

#### CHAFFEE COUNTY.

HORTENSE.—This mine has been leased. It is one of the best developed properties in the county, containing over two thousand feet of tunnel and drift. There is also a wagon-road to the mine, which cost $6000. A great deal of money has been expended on the property, and a considerable amount of good ore has been shipped. Only a small force has so far been put to work, but more men will be employed in a short time.

TWIN LAKE HYDRAULIC COMPANY.—A large amount of work will be shortly commenced by this company near Vicksburg. It will take out a ditch from Clear Creek, to work its placers in Cache Creek, which will involve the construction of about seven or eight miles of ditch and flume and a tunnel 1800 feet long through the divide between the creeks. It will be recollected that the company recently purchased the rich placers in Cache Creek, lately owned by the Gaff Mining Company. The chief difficulty heretofore experienced, a lack of water, will be entirely obviated by this new enterprise.

#### CLEAR CREEK COUNTY.

Under date of September 7th, Mr. Linwood O. Towne sends us the following notes from Rico:

GRAND VIEW.—Something of the nature of a "strike" has been taking place for the week past among a large number of the workmen employed by the company. Work at the smelter has, however, not been interrupted, new men being found without difficulty where necessary. Besides Rico mines, the Silver Bell of Ophir is furnishing a large and constant supply of ore to this smelter.

LITTLE MAGGIE.—This mine is now working a force of men, and shipping ore daily to the Grand View smelter. Development is being pushed by means of a tunnel now in 320 feet, and in incline, down 100 feet, with drifts from the latter. The shipments, which are mainly from the tunnel, consist of carbonate and sulphate of lead, running well in silver.

NEWMAN GROUP.—It is rumored that this group, on which, for some unknown reason, no work has been done all summer, will soon be opened and worked under the efficient management of Mr. F. W. Reed.

SOUTH PARK.—The main tunnel is now in 400 feet. Within a few days, a small quantity of low-grade lead carbonate was exposed, which, however, at once changed into the usual high-grade sulphide and native silver, which latter has been found in greater abundance in South Park than elsewhere in Rico.

MATTIE.—During August, seventy-one tons of smelting ore were shipped, which netted the company $7300. At present, the third level shows a continuous ore-body, which in the breast is about a foot wide solid, besides mineralized quartz aarying in width from six to twenty inches. The ore is mainly gray copper, and at this point seems even richer than that hitherto traversed. This month the output will be largely increased over August.

#### HINSDALE COUNTY.

CROOKE MINING AND SMELTING COMPANY.—The output of the Ute and Ulé for August was 600 tons. The new shaft from the third level of the Ute is 60 feet deep on a 4-foot vein. The quartz is banded with 10-inch streaks of mineral. Should the width of vein continue in the level below as above, it will open stoping ground for two years at an output of 300 tons a month. The Ulé drift west in the 7th level continues its usual production of ore. This level has been drifted 250 feet over a fine body of ore. The stopes above are producing largely. Up to September 1st, there were 2400 tons of concentrates stored in Lake City by this company.

#### LAKE COUNTY.

AMIE.—The No. 2 shaft has been leased, and parties are now making preparations to work the mine. The belief is current that quite a body of mineral still remains in the stopes to the south of the shaft, now inaccessible on account of the caving of some of the drifts. To reach the prospective bonanza, the present lessees will drive a drift on the 130-foot level to the southwest, and penetrate the old stopes.

BIG CHIEF.—The drift driven to the east and starting from a point near the Castle View shaft, is about 150 feet in length, and at its face a winze down 25 feet shows five feet of ore and 20 feet of good iron. The ore runs from 50 to 60 per cent in lead and from six to ten ounces in silver, and is a fine gray sand. The iron also runs well in silver.

CATALPA.—The lessees have done considerable exploration-work within the past few weeks, resulting in the development of several small ore-bodies. The mine has begun extracting ore and will resume shipments shortly.

CHRYSOLITE.—The iron incline from the Colorado shaft No. 2 is now within about 275 feet of the Roberts shaft. Recently the mineral showed a great improvement, but before development could be sufficiently advanced to prove up the prospective mineral body, the water drove the miners out. During the past few days, three pumps have been kept in active operation in the incline, and the water is lowering quite rapidly. The draining of the incline is also affecting the Roberts shaft, in which the water is falling at the rate of about two feet per day. The ore-shipments from the mine are about the same as for a number of months past. The company has about $240,000; one half of which is loaned out drawing four and six per cent, and the remainder is out on call loans. The revenue derived from its capital is ample to pay the expenses of the company in the East and leave a surplus. Although a great deal of expensive exploration has been done in the past twelve months, the earnings of the mine have been in excess of the expenditures, and the fiscal year will show a slight gain.

COLONEL SELLERS.—The lessees of the lower shaft are reported to have struck ore at a depth of 210 feet. The mineral is iron pyrites and galena. The Little Helen shaft, adjoining, is also reported in mineral.

DOLPHIN.—In this property, adjoining the Matchless mine on the south and west, new developments have been made recently, which promise to permit the mine to make extensive shipments of rich ore again. For some time past, the mine showed little or no pay ore, and considerable exploration-work was done, which finally resulted in opening a body of black iron ore, situated west of the working-shaft. The mineral carries no lead, but considerable chloride of silver.

HIBERNIA CONSOLIDATION.—The recent strike in the new south shaft on the May Queen claim proves to be one of the most important and remarkable discoveries made this year. For years past, exploration-work has been in progress on this hill, and innumerable new shafts have been sunk, without success, however, until the present shaft was put down. Sinking has progressed, and the development now shows twenty-one feet of ore, and the dump contains at least eighty tons of fine shipping mineral. The new strike gives promise of opening out a large shoot of ore, the trend of which is carrying it through the heart of the Hibernia Consolidation and other properties to the east.

IRON SILVER.—Several hundred tons of ore have already been taken from the recent strike in the Moyer shaft.

LEADVILLE GOLD AND SILVER MILLING COMPANY.—The mill, idle for some weeks past, will resume operations the early part of next week. The mill is now receiving ores from the Robert E. Lee dump, and, when started up again, will run regularly.

LITTLE CHIEF.—A settlement was made by this company with the smelter for the first ore from the new strike, and amounted to fifty-eight tons net weight. The ore averages 154 ounces to the ton. The mine also settled for a small lot of ore sorted from the old dump, which returned about $1000. The two settlements returned the company, $10,000, will be transmitted to the New York office. There are four additional lots of ore at the smelter, which will be settled for in a few days. Two of these are mineral extracted from the new ore-body, while the other two are second and third-class material. It is calculated that the mine will earn during September at least $20,000, and possibly considerably in excess of this amount. The new ore-body is not as solid at present as it was a week ago, the high grade ore being scattered through the iron. One breast, however, shows about ten feet of $50-ore, while in portions several feet of $100 to $150-ore are exposed. The drifts running on mineral are advanced. The first, having a northwesterly course, has a length of forty-five feet, the other heads to the northeast, and is in ten feet. Both drifts show good ore.

The favorable result of the new strike shows itself in a dividend of $20,000, payable October 9th. This dividend is the first declared since August, 1880.

MAID OF ERIN.—That portion of this claim not in conflict has been leased to parties working the Big Chief mine. Considerable high-grade ore is taken out.

NEW PITTSBURG.—The Keene shaft, which had a depth of 217 feet when work was begun, is down 328 feet. A drift is driving from the bottom of the shaft to the southwest. An incline is also worked, having an easterly course. The product of the mine is not as large as it was some months ago. For some time past, the Heytrosser shaft has been worked for iron. The mineral carried from ten to twenty ounces in silver to the ton, and forty per cent of iron in excess of the silicon.

PILOT.—This mine, on Printer Boy Hill, recently shipped three loads of ore to the Elgin Smelting-Works, averaging about thirty dollars per ton above smelting charges. The mine is now reported to show about five feet of ore, from which assays have been obtained of seven ounces in gold and fourteen in silver to the ton.

#### PARK COUNTY.

The Hall Valley camp is fast coming into prominence, and bids fair to soon rank with the best ore-producing districts of the State. A correspondent of the Denver *Tribune* says that the extensive and very complete mill fitted up during the past year by the Quincy Mining and Milling Company has afforded an opportunity for treating the ores, which until now have lain on the dumps awaiting the time when the means for their treatment should be furnished. As a direct result, more claims have been worked this season than ever before. The Hall's Gulch Consolidated Mining and Tunnel Company has been working the past two years, and is now rewarded by a splendid showing of high-grade ore, particularly in the shaft now sinking on the Great Eastern. At a depth of 100 feet, a vein about two inches wide has appeared, showing black copper and silver glance. The ore-bodies in the several shafts and tunnels show veins of bismuth and copper ore, carrying silver from 18 inches to over three feet in width, and mill-runs on car-load lots give $85 to the ton, the ore showing richer as progress from the surface is made. A large force of men is at work day and night on this mine. The Manhattan is another claim owned and worked by this company, and is making an excellent showing at the present time. A large quantity of ore in the ore-house ready for shipment showed it to be rich in copper and galena, carrying a large percentage of silver.

The Ypsilanti Mining Company, located near the Great Eastern, is showing up well. A force of 30 men is now engaged day and night, and with the most satisfactory results. A large amount of ore is shipped daily for treatment. This property has been recently purchased.

The Bullion Prince Mining Company is working day and night-shifts on its cross-cut tunnel, run to cut the Brooklyn and Tropic lodes, which have been found to be valuable by sinking shafts. The ore is galena and gray copper, carrying silver. A mill-run of ore taken from the Brooklyn shaft near the surface gave a value of $44 per ton at the smelting-works at Golden. These lodes will be cut by the tunnel at a depth of over 300 feet, and it is expected large ore-bodies will be developed when the Brooklyn lode is reached, which is now only a few feet from the breast of the tunnel.

The Lisbon Mining Company has a claim in the Whale Extension, so called on account of its being an extension and next adjoining the famous Whale mine. The ore shows at the surface, and only a slight excavation disclosed a solid pay-streak of galena and silver from four to six inches in width.

The Snake River Mining Company has a shaft 100 feet deep in the Rosalie, with tunnels running into the mountain from the shaft, from which shipments of ore have been made of satisfactory value to the owners, who are preparing to work the properties on a much larger scale than before. The ore is free-milling, showing silver only, and is easily worked. The smelter at Argo gives mill-runs of 61 ounces to the ton in ore taken less than 25 feet from the surface.

FANNY BARRET.—The large caves lately discovered in these workings are not in a proper condition to thoroughly explore; consequently but little is as yet known regarding the real mineral value of their contents. Large bodies of iron exist in every section yet examined, and it is thought that when they have been thoroughly examined in all their openings, some valuable mineral will be found.

PITKIN COUNTY.

TAM O'SHANTER & MONTEZUMA.—For some weeks past, these mines have been shipping largely and regularly to Cañon City. Recently, Governor Tabor leased the Ashcroft, formerly the Brooks & Bethune smelter, and arrangements were made for reducing the product of the mine near the premises. Metallurgists have been on the ground, and pronounce the project practical. The mines are capable of producing fifty tons a day, and able to keep the works in blast. The reduction of the ore, it is said, can be effected a great deal cheaper at the mine than at Cañon City, including freight on ore.

SUMMIT COUNTY.

SILVER WAVE.—A rich strike of sand carbonates was recently made in this mine on Battle Mountain. The ore-body is between sixteen and seventeen feet in thickness, and runs nineteen ounces in silver and 75 per cent in lead.

## DAKOTA.

CALEDONIA.—The superintendent reports for the week ended September 2d: Ore produced, 300-foot level, 1050 tons; shipped, 595½ ounces of gold; value, about $10,250. East cross-cut on 400-foot level has reached hanging-wall; work discontinued in this direction. The south drift is in 5½ feet.

ESTRELLA DEL NORTE.—The clean-ups are yielding very satisfactory returns, and, according to local papers, fully justifying the high opinion entertained regarding those properties.

FATHER DE SMET.—The superintendent's report for the ten days ended September 1st shows: Ore extracted from first level, 1200 tons; second level, 1200 tons; third level, 620 tons. Ore milled, 2970 tons. Golden Gate, south header, second level, in 24 feet. On August 21st, the total length of header was 19 feet, instead of 20 feet, as reported. Contract work stopped, header being run on company account.

IRON CITY.—W. E. Fulton, who recently went to Deadwood to examine the silver mines of the Iron City Mining Company, reports that they are valuable properties. General Manager Porter has been removed for mismanagement, and the mines will be further developed.

## IDAHO.

The Willoughby, Clifford, Geneva, and Euclid claims have been sold to an Ohio company.

BULLWACKER.—An experimental run of this ore was made recently. A sample lot of about 15 pounds was put through the furnace. The result was two bars of base bullion weighing about seven pounds, and assaying at the rate of 290 ounces of silver per ton.

QUEEN OF THE HILLS.—The ore of this mine is very bright and pure galena, going about 75 per cent lead and 104 ounces silver. A new strike was made recently in the tunnel 225 feet from the mouth, and at a vertical depth from the surface of 150 feet. The vein, where struck, and on which some drifting has been done, is in width from twenty to forty-two inches, varying in different places. Besides this width of solid galena, there are eighteen inches of second-class ore. This strike is in solid ground, and is of so much importance that the property is looked upon as being worth double what it was estimated at, and was offered for it ten days ago, when parties wanted it at $25,000. It is near the Minnie Moore mine, and is supposed to be similar in quality and extent.

## MEXICO.

SANTA BARBARA MINING DISTRICT.

The Chihuahua *Enterprise* speaks of this district as follows:

Among the principal mining districts of this State, Santa Barbara takes a foremost place. The ores are all low, hardly any going beyond three hundred dollars per ton, and as low as twenty dollars. All the silver is carried by the carbonates and sulphurets of lead. To work these ores, a large concentrating-mill is erecting by the Tecolote Silver Mining Company, of Harrisburg, Pa., which acquired by purchase three mines, Tecolote, Tecolotes de Abajo, and Santa Maria de la Bufa. About one and a quarter miles from the mines, the mill is building, and of the railroad from the mines to the mill, 855 feet. As the property is situated on a very high mountain, in fact, the principal one of the district, all the ore to be milled can be taken out of the mines by tunnels, and no money will have to be spent for hoisting and pumping water. Two hundred and sixty-six feet of new tunnels have been run already in the vein, producing ores daily, and 270 feet of cross-cut tunnel, half-way up the mountain. The mill machinery and rails are already on the road.

## MICHIGAN.

The following is the product of the mines named for the month of August:

| | Tons. |
|---|---|
| Calumet & Hecla | 1833 |
| Quincy | 332 |
| Franklin | 183 |
| Atlantic | 166 |
| Allouez | 111 |
| Pewabic | 55 |
| Huron | 53 |
| Peninsula | 51 |
| Copper Falls | 39 |
| Grand Portage | 39 |
| Hancock | 36 |

Mr. Edward Ryan has purchased 39 acres of land on Pilgrim River at its mouth, for a stamp-mill site, in connection with the valuable copper disclosures he is interested in lying to the southwest, near Six-Mile Hill, on the Ontopagon road. The Houghton *Mining Gazette* says that one of the leading advantages of this location for reduction-works consists in being able to "flume" water from Pilgrim River into a mill for mineral dressing purposes, thus saving the cost of pumping, which is an expensive item. Mr. Ryan has also organized a corporation, called the Houghton & Rockland Railroad Company, for the purpose of furnishing rock transportation facilities from the mining lands he is handling to the lake shore at Pilgrim River, and extending the road along the mineral range to Ontonagon County, if developments in the future out that way warrant its construction.

ANDERSON.—Work at this property has recently been attended with most gratifying results, the ore taking a sudden change for the better, being now almost entirely free from the bunchy quartz which has thus far appeared. The shaft is now down 115 feet in the ledge on the foot-wall side of the vein, and if the ore continues to improve as it has in the last four feet, the shaft will be sunk but a few feet farther, when a drift will be run across the vein to further determine its value.

CALUMET & HECLA.—The improved iron jig will soon be put in the place of the wooden jigger in the dressing-mills of this mine.

CONGLOMERATE.—The extensive surface improvements on this mine are now well in hand. The new dressing-works, which embrace one of the most complete stamp-mills on the lake, will be ready to go into operation in a month or so. The railroad from the mine to the dressing-works will be in running order by the first of October.

EMMET.—This company has decided to sink another shaft 1000 feet to the northeast of the one now going down, and which will be in swampy ground. It is expected this work will require about two years to see its completion.

LAKE CHICAGOAN.—The mine has been unwatered and mining operations resumed.

MILWAUKEE.—It is probable that work will be resumed shortly. Arrangements are in progress whereby the question of royalty will probably be adjusted to the satisfaction of all parties concerned. The new rate will probably be 40 cents per ton.

OSCEOLA.—Developments in the old Osceola mine, on the deposit lying immediately west of the conglomerate, continue promising, and the openings afford considerable copper considering their extent.

PENDILL.—What was left of the effects of this mine has been sold recently to satisfy the claims of creditors. The old location will be used by the Detroit, Mackinac & Marquette Railroad Company as a depot site.

## MONTANA.

BEAVER HEAD COUNTY.

HECLA CONSOLIDATED.—A committee of stockholders, consisting of Hon. Thomas A. Hendricks, Judge E. B. Martindale, Hon. John C. Wright, and Hon. A. D. Lynch, who recently made a minute examination of the property and works of the company, make the following report to the board of directors regarding the management of Superintendent Knippenberg: The general management of the property, under Mr. Henry Knippenberg, is characterized throughout by intelligence, integrity, and economy. He has surrounded himself by the best class of men that could be collected in a large mining enterprise, and has succeeded in instilling into each the desire which is uppermost in his own mind, that is, to promote the interests of the stockholders. While we can not enter into details, we think it is proper to say that the company is peculiarly fortunate in securing the services of Mr. Knippenberg as general manager, and of Mr. James Parfet as superintendent of the mines. Mr. Parfet has displayed great skill in opening up the mines, and great energy and sagacity in keeping his reserves in sight, so as to be able at all times to point out the ores required to keep the concentrator and smelter employed, for a full year in advance, without additional development.

GALLATIN COUNTY.

EASTERN MONTANA MINING AND SMELTING COMPANY.—The smelter has started up on custom rock and is making weekly shipments. It is under lease to the Wills Mining and Smelting Company, and will be run regularly.

GREAT REPUBLIC.—The water-jacket smelter now erecting at Cooke City, to treat the ores of this and other mines owned by the company, will have a capacity of forty tons.

JEFFERSON COUNTY.

News from the mines around Boulder Valley shows the following:

ALICE.—While running an open cut on this claim, to find the vein before sinking a shaft, ore was found which returned 199 ounces of silver to the ton.

AMAZON MINING AND SMELTING COMPANY.—Some good ore is taken from the Lexington, the property of this company. The company's machinery has arrived in Helena, and will be sent to the mines at once.

BOBTAIL.—This mine is developed by a shaft 70 feet deep and another shaft 25 feet deep; the pay-streak is two feet wide, and produced very fine carbonates of lead on the surface; at the bottom, the ore is mostly galena. The ore is of a very good grade in lead and melts very easy. Several lots have been shipped, and yielded from 50 to 300 ounces in silver to the ton.

EQUITABLE.—The company owns some very promising prospects. Most of the work is done on the Willie location. The shaft sunk is now 55 feet deep, and the ore produced shows highest assays.

JOSEPHINE.—This claim, owned by the same parties as the Bobtail, shows about the same character of ore. The shaft is 25 feet deep, and at the bottom the vein proves to be seven feet wide.

STOCKTON.—A body of ore six feet wide, with only one wall exposed as yet, has been struck in the new shaft at a depth of 23 feet. The ore consists of a streak of galena about one foot thick, a sample of which assayed eighty-six ounces in silver and $35 in gold to the ton, the other five feet consisting of good concentrating ore. This lode is opened by four shafts, developing the vein for a length of over 200 feet, and there is good ore in every one of the shafts. A tunnel is now driving which will tap the vein 125 feet below the surface. The tunnel is 60 feet in, with about 90 feet more to run.

LEWIS & CLARKE COUNTY.

GLOSTER.—The work at the mine is progressing rapidly. The pan-sills are in for the new pan-mill, the grading is all completed, and the foundation-walls of the enormous building (200 by 60 feet and 80 feet high) are all laid. The excavations for the foundation for the large 300 horse-power engine are making. The entire sixty-stamp mill with twenty-four pans and twelve settlers, crushing 180 tons of ore per twenty-four hours, will be running by the 1st of November. The contractor has begun work on the shaft, and expects to sink 100 feet within ninety days. This shaft will be 18½ by 7½ feet, with three compartments.

SILVER BOW COUNTY—SUMMIT VALLEY DISTRICT.

CLARK'S FRACTION.—The developments at this mine, which lies between the Alice and Magna Charta properties, continue to demonstrate the value of the old Rainbow lode. The 40-foot ledge in the face of the 80-foot cross-cut has been fully described in previous reports. A drift has been run from the east 300 feet of the Alice, which has reached a point directly beneath the 80-foot workings, and a three-foot ledge of high-grade ore has been uncovered. The assays average 100 ounces, and several samples went from 230 to 530 ounces. The drift will be run through the Fraction 221 feet to the Magna Charta line, when cross-cutting and uprising on the ledge will be commenced.

SHONBAR.—The principal work just now is sinking the shaft for the 300, 400, and 500-foot levels. An additional pump has been put in at the 230, which keeps the water clear.

TRAVOLNA.—W. A. Clark has purchased S. E. Larabie's interest in this mine, in which the first discovery of silver in Summit Valley District was made by William Farlin in 1875. Mr. Clark is preparing to begin active operations in the mine.

## NEVADA.

ELKO COUNTY.

INDEPENDENCE.—The superintendent's annual report shows that during the past year 267 17-20 tons of ore, averaging $322.88 per ton, have been extracted and milled. The Navajo Mining Company, having the mill in use, milled the ore

at the rate of $25 per ton, net cost, and worked it to 93 per cent of the battery assay. Settlement was made at that percentage. We received and shipped to the Anglo Bank of California bullion to the amount of $62,910.45; and after deducting bullion discount, on the balance of the bullion, and paying for the milling of the ore, we received from the Navajo Company in coin $8472.07. The ore-seam averaged very small, but the grade of ore ran unusually high. This ore was extracted above the 300 level, and considerable work has been done in the same locality without discovering any more ore. Above this ore-chute, drifts and cross-cuts have been driven to the extent of about 200 feet, and a cross-cut on the level extended west a distance of 612 feet. Nothing of value was developed in these workings. The west cross-cut passed through a very hard formation, and the ventilation being very bad, progress was slow, and the work necessarily expensive. The main drift north on this level has been extended during the past year 380 feet. The formation encountered looks very favorable for ore; and in time, cross-cuts will be extended to the right and left, to thoroughly prospect the ground then opened. On the 400 level, a prospect-drift has been driven south 928 feet. It will be continued until it has reached a point under No. 1 shaft at the south end of the mine, which has been sunk to the depth of 190⅓ feet. At this point, connection with the shaft by an uprise will be made, thereby securing good ventilation. At present, a fan is kept running constantly, to enable us to work in the drift. As soon as this connection is made, cross-cuts can be extended at all favorable points. About 400 feet from the face of the drift, one cross-cut has been started east, and is in 105 feet, and one west advanced 18 feet. In this distance, nothing of note has been encountered. Considerable work has been done in repairing and retimbering old drifts, necessary to be kept open, in view of future workings. Although no development of any consequence has been made the past year, the prospects are flattering for good results, when cross-cuts are extended from the drifts now driving north and south on the 300 and 400 levels.

NAVAJO.—The following is a summary report by the superintendent of the work done during the past year: Although some bullion was shipped prior to my last annual report, no estimate was made of the results of the experimental mill-run, conducted for ten days previous to that date; but the results from the same will now be included in the total estimate of the milling done for the past year.

The mill-run covers a period of 321 days, of which the actual running time was 309½ days; showing a loss of 11⅓ days, including all stoppages. Milled 3955·6 tons of Navajo ore, and 282⅕ tons of custom ore, making an average crushing of 13⅔ tons of ore per day. The average battery pulp-assay of the ore from the Navajo mine was $199.40 per ton, and was worked to 92·6 per cent of the battery assay; custom ore averaged $332.10 per ton, and was worked to 92 per cent.

Shipped bullion on customers' account to the amount of $64,863.42. On Navajo account, to the Bank of California, from Navajo ore $730,379.38; from custom ore, $21,549.37; from profits on custom ore, $2206.58, making a total production in bullion of $818,898.75 (assay value) from the 21st July, 1882, to the 7th June, 1883; of which amount $729,874.58 was shipped during the fiscal year on company account.

The quantity of ore crushed for a battery of ten stamps, and the percentage to which it was worked, has been unusually satisfactory. The condition of the mill for the last half of the run added materially to the cost of reduction, and the repairs required on the engine necessitated a suspension of work for a considerable length of time. The mill is now repairing, and, when completed, will materially reduce the cost of milling. Since the Grand Prize works were destroyed by fire, we have been without a supply of water. Will now make connection with the Navajo works, in anticipation of a partial and perhaps a sufficient supply when water is encountered on the 650-foot level.

During the past year, the shaft has been sunk 330 feet, making its total depth 680 feet. The formation encountered was extremely hard and difficult to work, requiring ten months' steady work to sink it to its present depth.

The ore reserves on the 650, 500, and 450 levels are sufficient to supply the mill for a considerable length of time, although the grade of ore may be as much lower, as that milled the past year has proved to be higher than it was placed at in my estimates of last year.

As soon as the compressor is in working order, pipes will be laid to conduct compressed air to the various points where work is in progress, and power drills will hereafter be used in place of hand-drilling, which we expect will result favorably in an economical point of view, as well as speedier work, of which there is no doubt, as the rock encountered in this mine is extremely hard, and, by hand-drilling, progress necessarily slow and expensive.

Prospect-work has been carried on to an extent to readily determine, at a nominal expense, the value of as many new levels as have been explored during the past five years.

WHITE PINE COUNTY.

MARTIN WHITE.—At the annual meeting, held in San Francisco recently, the following report was presented:

We have run on the upper level 286 feet of drifts. In doing this, we have extracted 120 tons of ore, assaying from 30 to 200 ounces and over. One half of a ton that was put in sacks will assay 5000 ounces per ton. We have also found a good body of ore, into which we have drifted twenty feet, and the ore taken out will assay 80 ounces altogether. The vein is wider than the drift, but I do not know how much. From the location of this ore and its character, I think it is the most valuable body of ore that has been opened within the year. We have worked out stope No. 1 on the 160-foot level, from which were extracted about 400 tons of ore, assaying 30 ounces and upward, besides a large amount of second-class ore that will be worked at a profit some future time. We are now working in two places on this level with fair promises as to ore. We are also working on a small body of ore in the Mountain Pride tunnel that promises well, the ore assaying over 30 ounces. This body or vein has been drifted on about thirty feet. Some of the distance, the drift cuts all the ore; in others, the ore extends beyond the sides or limits of the drift. Although small, this is the best find of ore that we ever had on this level in my estimation, as it is directly under the best ore-bodies of the upper levels, and it will probably connect with them.

The secretary's report shows that there is $33,513.30 worth of supplies on hand and ore extracted valued at $44,182.30.

## MINERAL PATENTS GRANTED BY THE UNITED STATES LAND-OFFICE.

The following mineral patents have been granted by the General Land-Office since the last date:

### ARIZONA.

TUCSON DISTRICT.

Solomon Warner, Santa Tomas lode. Horseshoe Mining Company, Alta lode. Merrimac Silver Mining Company, Lucknow lode. Heirs of Jacques Traves, deceased, Mariquitta lode. Joseph McCarter, Cuprite lode. Philip Corbin *et al.*, Hendricks lode.

### CALIFORNIA.

MARYSVILLE DISTRICT.

J. M. Ward, placer. John A. Edman, Victor and Diadem quartz mines. Albert E. Malmlund, Red Point quartz mine. B. B. Jordan, placer. Floyd Taber, placer.

SACRAMENTO DISTRICT.

Gold Hill Mining Company, Gold Hill quartz mine. Charles Hegarty, Gold Beater quartz mine. Digory Hobbs *et al.*, California quartz mine. James L. Sperry, placer. A. Chichizola *et al.*, placer. Thomas Legg *et al.*, Chicago quartz mine. George G. Allen, California Consolidated quartz mine.

STOCKTON DISTRICT.

Alvin A. Preston *et al.*, Grecian Bend placer.

### COLORADO.

CENTRAL CITY DISTRICT.

Annie R. Sprenger *et al.*, Edinburgh lode. Benjamin T. Wells, Seven Twenty lode. Robert M. Richardson *et al.*, My Daisy lode. Peter D. Graham, Graham lode. Consolidated Bobtail Gold Mining Company, Warnick lode. Clarence Stephens, Harrison lode. Alfred E. Lea, Cornet No. 2 lode. John Turck, Aliunde Tunnel No. 1 lode. Enoch J. Coffman *et al.*, Lord Byron lode. George W. Hall, What You Please lode. Diamond Tunnel Gold and Silver Mining Company, of Baltimore City, West E. K. Baxter Sulphuret lode. Winnebago & O. K. Mining Company, Dean lode. W. G. McDowell *et al.*, Nellie Maud lode. Laura Schwartz, Silver Glance lode. Samuel Dagenais, Dum Spiro Spero lode. Charles P. Baldwin, Highland Laddie lode. John Olsen *et al.*, Mammoth lode and mill-site. Pelican & Dives Mining Company, Bertha lode. D. C. Barber *et al.*, Tamaroa and Du Quoin lodes. William Williams *et al.*, Last Chance lode. H. B. Benton, Baltimore Belle lode. A. H. Colburn, Sporting Times lode. Jacob Geyer, Maverick lode.

DURANGO DISTRICT.

E. J. Warner, Boston placer. Thomas Blair, placer. Oriental Mining Company, Oriental lode. Abbie A. Bock *et al.*, Tornado No. 1 lode. Cleveland Consolidated Mining Company of Colorado, Cumberland and Alabama lodes and mill-sites. D. A. Cook *et al.*, Catalpa lode. Dolores Silver Mining Company, Atlantic Cable lode.

LAKE CITY DISTRICT.

Dennis Kenyon *et al.*, Jim Fisk lode. Summit Mining Company, Summit lode. Belle of Ouray Silver Mining Company, Belle of Ouray lode. Riverside Tunnel and Mining Company, Riverside lode and mill-site. George N. Propper *et al.*, Grizzly Bear and Seventy Six lodes. Providence Mining Company, Belle of the West lode and mill-site. J. W. Strayer *et al.*, Cincinnati lode. Eugene Parsell, H. D. Nye and Bonanza King lodes. Manhattan & San Juan Silver Mining Company, Occident lode. Indian Chief Mining and Milling Company, Extension lode. Henry Lawrence *et al.*, J. B. Trickey lode.

LEADVILLE DISTRICT.

Warrior's Mark Mining Company, Ætna, Warrior's Mark, Warrior's Mark No. 2, Cassandra No. 1, Cassandra No. 2, Cassandra No. 3, Cassandra No. 4, Cassandra No. 5, Queer Name No. 1, and Queer Name No. 2 lodes. Excelsior Consolidated Gold and Silver Mining Company, Little Hattie lode. Thomas S. Wells, placer. W. Z. Ransom *et al.*, placer. Aileghany Mining, Smelting, Tunneling, and Milling Company, placer and Randell placer. George M. Robison *et al.*, Laura lode. Charles F. Reynolds *et al.*, Main lode. B. B. Hugus *et al.*, Alpha, Maverick, and Beta lodes. John S. Harris *et al.*, Hiland Chief, Miller, Dolphin, and Hazeltone lodes. Moses H. Evans, John C. Godfrey lode. George E. Pease *et al.*, First National and Nisi Prius Extension lodes. Harold Godwin *et al.*, Germania lode. J. W. Kennedy *et al.*, Pointer lode. Diana Mining Company, Diana lode. John A. Smith *et al.*, Omega and Alpha lodes. H. C. Bostwick, Mineral Point, Big Smoke, and Little Lilly lodes. Lyman Fay, Rip Van Winkle lode. E. J. Hawkins *et al.*, Hoosier lode. J. P. Whitney, Claremont lode. George Yule *et al.*, Pacific lode. Pitkin County Mining Company, Bob Ingersoll lode. George S. Newman *et al.*, Cod Fish Balls lode. John R. Bensley *et al.*, Montreal lode. William R. Pollock *et al.*, Cassa lode. Federal Silver Mining Company of Colorado, Henry D. Foote and B. F. Warren lodes. New Haven Mining Company, Bullion lode. Sidney S. Chapman, Aërie lode. Monarch Mining Company, Great Monarch lode. William A. Morrison *et al.*, Susquehanna lode. John Boylan *et al.*, placer including lodes. J. W. Smith *et al.*, Montezuma lode and mill-site. Abner R. Brown *et al.*, Silver Crown lode. Charles G. Arnold, placer.

PUEBLO DISTRICT.

W. J. Schoolfield *et al.*, Rappahannock lode. Richard Irwin *et al.*, G. W. lode. James Turner *et al.*, Denver No. 2 lode and mill-site.

### DAKOTA.

DEADWOOD DISTRICT.

Jacob H. Benham *et al.*, Eureka lode. James ——, Chief of the Hills No. 2 lode.

### IDAHO.

BOISE CITY DISTRICT.

Vienna Consolidated Mining Company, Alturas lode. James B. Haggin, Pittsburg lode. Ornament Gold and Silver Mining Company, Trade-Dollar and Ornament lodes and mill-sites. Robert C. Chambers *et al.*, Sentinel lode and mill-site. Ohio Consolidated Gold and Silver Mining Company, Ohio North and Ohio South lodes and mill-sites.

### MONTANA.

HELENA DISTRICT.

Daniel C. Noble, Company and Company No. 2 lodes and mill-sites. Edward King, placer. Marcus Daly, Rob Roy lode. Lee Mantle, Britannia lode. Henry Elling *et al.*, Strawberry lode. George Woodworth *et al.*, Black Hawk lode. O. B. O'Bannon, placer. Thomas Ford *et al.*, Elm Orlon lode. William A. Clark *et al.*, Piccolo lode.

### NEVADA.

CARSON CITY DISTRICT.

Ferdinand S. Van Zandt, Bonanza and Alameda No. 2 lodes. J. B. Overton, Santa Rita lode. Auburn Consolidated Gold Mining Company, Paine and Silver State lodes.

EUREKA DISTRICT.

Madeline Goetz *et al.*, Star of the West lode. A. L. Fitzgerald, Geraldine lode and mill-site. Nicholas Barlow *et al.*, Belle of the West No. 2 lode. Luther Clarke, Central Consolidated lode. J. A. Miller, Perkins lode. Falcon Mining Company, Gazelle and Henry Clay lodes. Thomas Wesry *et al.*, Central Hill lode.

### NEW MEXICO.

LAS CRUCES DISTRICT.

Thomas F. Conway *et al.*, Ivanhoe lode. John D. Bail *et al.*, Contention lode. Mimbres Mining and Reduction Works Company, San José lode.

SANTA FE DISTRICT.

Abraham Spiegelberg *et al.*, Bourbon and Norma lodes.

### OREGON.

LA GRAND DISTRICT.

Samuel Colt and Hiram Colt, placer.

### UTAH.

SALT LAKE CITY DISTRICT.

Samuel W. Smith *et al.*, Cornucopia ledge and Company and Silver Coin lodes. Silver Key Mining Company, Old Judge lode. Lehi W. Jones, coal. George J. Marsh, coal. New Bedford Silver Mining Company of Utah, Lackawaxen and Sallie Murphy lodes.

## FINANCIAL.

### Gold and Silver Stocks.

NEW YORK, Friday Evening, Sept. 14.

The mining market this week has shown considerable activity, and better prices have prevailed. The chief interest has been centered in the Leadville stocks, which have been quite active and strong. This is owing to several important strikes having been made in the district, and the prospects of early dividends being declared by some of the companies having mines there. Amie leads in the transactions, and, as a dividend has been declared, it sold quite strong. Little Chief was also very strong under reports of a rich strike. The fancy stocks have come in for a good share of the business done, but about the only one which has shown any change in price has been Robinson, which has been weak. Eastern Oregon has been allowed to drop back to its normal figures, the "bull" clique evidently becoming tired of booming it. The total number of shares aggregates 165,926 shares, as against 133,810 last week.

The Comstock shares were very moderately dealt in at about steady prices. California was quiet and a little weak, selling from 30@24c. Consolidated Virginia was also quiet and irregular; it sold from 56@53@54c. Sierra Nevada was weak, under a very small business, selling from $5.50@$4@$4.25. Union Consolidated was quiet and steady at $4.90@$5. Ophir sold at $4.25; Gould & Curry at $3.25; Hale & Norcross at $4.70; Yellow Jacket at $3; and Best & Belcher at $4.40. These stocks all record but one transaction each. Sutro Tunnel was very quiet and steady, selling at 19c.

The Leadville stocks show a decided improvement both in the dealings and prices. This is owing to several rich strikes recently made in this district. Amie was very active and quite strong, selling from 13@23c. This company has recently declared a dividend, the first in several years. It is rumored that this dividend was declared by the present managers, in order that they might retain the control of the company, as there has been a decided disposition on the part of some of the stockholders to oust them from the management. Chrysolite was also strong, with a fair business, selling from $1.10@$1.25@$1.15. Dunkin was quiet and steady, selling from 32@36@35c. Breece sold from 19@18c. Iron Silver was quiet and steady at $3.10@$3@$3.05. A rich strike has been made in the Moyer shaft of one of this company's mines, and it is reported that a dividend will soon be declared. Leadville was quiet and steady at 32@30c. Little Chief was active and quite strong, selling from 47@61c. A rich strike is reported to have been made in this mine. Little Pittsburg was also strong, with a small business, selling from 57@63c. Climax sold from 10@8c.; the business was small.

The Bodie stocks were quiet and steady. Bodie Consolidated was quite strong under a small business, selling from 70@95c. Standard was a little weak, under small transactions, selling from $5.50@$5.25. Bulwer sold at 70c. North Standard was quiet and steady at 7@10c.

The Tuscarora stocks were very quiet at steady prices. Navajo was quiet at $2.50. North Belle Isle was moderately dealt in at steady prices, selling from 47@45c. Elko Consolidated suffered a slight decline from last week, under an active business; it sold from 12@10c.

In the miscellaneous list, Alice was quiet and steady at $2.10@$2.15. Eureka Consolidated was quite strong, with a fair business, selling from $7.13@$7.63. Green Mountain was quiet and steady at 70c. Hall-Anderson was fairly dealt in and was steady; it sold from $1.25@$1.15. Horn-Silver was quiet and strong, selling from $7.13@$7. This mine is reported as looking very well. The annual meeting of stockholders will soon take place in Utah. Northern Belle was moderately active and was a little weak; it sold from $6.13@$5.88. Robinson Consolidated was very active and weak; it sold from 47@37@38c. Sierra Grande was very quiet at steady prices, selling at $1.05.

Alta-Montana was quiet and steady at 4@5c. Barcelona was active and irregular, selling from 34@49@40c. Central Arizona was quiet and strong, selling from 25@30c. Eastern Oregon was quite weak from its recent strong prices, with a small business, selling from 40@46c. Oriental & Miller sold from 12@10c., with small transactions. Sonora Consolidated was quiet and steady, selling from 24@30@27c.

The Secretary of the Tombstone Mill and Mining Company writes us that the company has just completed the payment of another installment of $25,000 on its funded debt; that the mill and furnace are now running regularly; and that the mines promise well for the future.

#### MEETINGS.

Dunkin Mining Company. Office of the company, Leadville, Colorado. Election of trustees and the transaction of such other business as may come before the meeting, October 12th, at twelve o'clock M.

The Horn-Silver Mining Company. Office of the company, Frisco, Utah. Annual meeting of stockholders and election of trustees on Tuesday, October 12th, at twelve o'clock M.

Little Chief Mining Company, No. 137 Broadway, New York City. Annual meeting of stockholders and election of trustees, October 2d, from twelve o'clock M. to two o'clock P.M.

The Sierra Grande Mining Company, the Sierra Bella Mining Company, the Sierra Apache Mining Company. Office of the company, Lake Valley, Mexico. Annual meeting and election of trustees, September 26th.

The Yedras Mining Company, No. 62 Cedar street, New York City. Special meeting of the stockholders Friday, September 21st, at twelve o'clock noon.

#### DIVIDENDS.

The Amie Consolidated Mining Company, of Colorado, has declared a dividend of five cents per share on the capital stock, payable at the office of the company October 2d, 1883. The transfer-books will close September 24th, and reopen October 10th, 1883.

The Barclay Coal Company, of Pennsylvania, announces a semi-annual dividend of three per cent, payable September 15th.

The Holyoke Mining Company, of Idaho, has declared a dividend (No. 12) of two per cent on the capital stock, payable September 18th.

The Homestake Mining Company, of Dakota, has declared a dividend (No. 61) of $50,000, payable September 25th. Total dividends to date $2,212,500.

The Little Chief Mining Company, of Colorado, has declared a dividend of $20,000, or ten cents per share, payable October 9th.

The Oro Grande Mill and Mining Company, of California, has declared a dividend of $24,000.

The Plymouth Consolidated Mining Company has declared a dividend of fifty cents per share.

#### PIPE LINE CERTIFICATES.

Messrs. Watson & Gibson, petroleum brokers, No. 49 Broadway, report as follows for the week:

During the latter part of last week, there was a dull dragging market, in the neighborhood of $1.08 for petroleum. On Monday morning, the announcement was made that the monthly statement for August of the United Pipe Line Company, instead of showing an increase of stock over the preceding month of about 80,000 barrels, showed a decrease of 197,000 barrels in gross stocks. It has been six or seven years since the surplus was reduced in any one month, and this fact was used as a pretext for manipulating the market to higher prices, forcing the shorts to cover and every body to go long. Under the influence of this statistical showing, and the advance to 8⅝ of refined oil, free buying was stimulated and the bulls were triumphant.

On Wednesday, the market opened at $1.16, sold up to $1.16¼, the highest point this month, when a general selling movement developed, carrying prices down to $1.12½. Meanwhile, the price of refined was reduced to 8⅛@8¼, and the fact became apparent that the "runs," or receipts, exceeded the shipments 23,000 barrels, and the decrease in gross stocks was due to the Pipe-Line Company charging off on its books over 200,000 barrels of oil. This was really deceptive to the trade until the figures were analyzed and the explanation given. Now, however, up to the 11th inclusive, the shipments nearly exceed the deliveries about 150,000 barrels, and September will probably show a real decrease in oil on hand. The charters for export are large, being at the rate of 55,000 barrels daily this month, against 49,000 in August and 39,000 in July.

The following table gives the quotations and sales at the New York Mining Stock and National Petroleum Exchange:

| | Opening. | Highest. | Lowest. | Closing. | Sales. |
|---|---|---|---|---|---|
| Sept. 8..... | $1.08 | $1.08¾ | $1.07⅞ | $1.08¾ | 747,000 |
| 10..... | 1.09 | 1.17⅞ | 1.08⅞ | 1.11⅞ | 3,514,000 |
| 11..... | 1.13⅛ | 1.15⅞ | 1.12¼ | 1.15⅝ | 4,954,000 |
| 12..... | 1.16 | 1.16⅝ | 1.11⅞ | 1.12½ | 5,890,000 |
| 13. .... | 1.12⅝ | 1.13¼ | 1.11⅜ | 1.11¼ | 3,031,000 |
| 14..... | 1.12 | 1.12½ | 1.11½ | 1.11½ | 1,606,000 |
| Total sales. ..... | | | | | 19,742,000 |

#### SAN FRANCISCO MINING STOCK QUOTATIONS.

*Daily Range of Prices for the Week.*

| NAME OF COMPANY. | CLOSING QUOTATIONS. Sept. 7. | Sept. 8. | Sept. 10. | Sept. 11. | Sept. 12. | Sept 13. |
|---|---|---|---|---|---|---|
| Albion | | | | | | |
| Alpha | 2¼ | 2¼ | 2¼ | 2½ | 2⅝ | 2½ |
| Alta | 1¾ | 1⅝ | 1⅝ | 1⅝ | 1½ | 1⅝ |
| Argenta | .10 | | | | | |
| Bechtel | | | | | | |
| Belcher | 1 | 1⅛ | 1⅛ | 1⅛ | 1¼ | 1⅛ |
| Belle Isle | | | | | .25 | .30 |
| Best & Belcher | 4 | 3⅞ | 3⅞ | 3⅞ | 3¾ | 3¾ |
| Bodie | .60 | .55 | .55 | .75 | 1 | .70 |
| Bullion | | | | | | |
| Bulwer | | | | | | |
| California | .25 | .25 | .25 | .25 | | .25 |
| Chollar | 3¼ | 3¼ | 3¼ | 3¼ | 3 | 3⅛ |
| Con. Virginia | .55 | .60 | .60 | .55 | .55 | .55 |
| Crown Point | 1¼ | 1¼ | 1¼ | 1⅜ | 1⅜ | 1⅜ |
| Elko Cons | | | | | | |
| Eureka Cons | 7½ | 7½ | 7½ | 8 | 8 | 7⅞ |
| Exchequer | | | | | | |
| Gould & Curry | 2¾ | 2¾ | 2¾ | 2¾ | 2¾ | 2¾ |
| Grand Prize | | .10 | .10 | .10 | | .10 |
| Hale & Norcross | 5 | 4¾ | 4¾ | 4⅛ | 4 | 4⅛ |
| Independence | | | | | | |
| Martin White | | | | | | |
| Mexican | 3½ | 3½ | 3½ | 3⅜ | 3¼ | 3¼ |
| Mono | | | | | | |
| Mount Diablo | 4½ | | | 4¾ | 4⅝ | |
| Navajo | 2⅝ | 2⅝ | 2⅝ | 2⅝ | 2¼ | 2⅝ |
| Northern Belle | 6¼ | 6¼ | 6¼ | 6 | | 6⅛ |
| North Belle Isle | | | | | | |
| Ophir | 3¾ | 3¾ | 3¾ | 3¾ | 3¾ | 3⅝ |
| Overman | | | | | | |
| Potosi | .80 | .85 | .85 | .85 | .75 | 1¼ |
| Savage | 2¼ | 2⅛ | 2⅛ | 2 | 2 | 2 |
| Scorpion | .60 | .50 | .50 | .60 | .55 | 60 |
| Sierra Nevada | 3¼ | 3¼ | 3¼ | 4¼ | 4⅛ | 4⅛ |
| Silver King | | | | | | |
| Tip-Top | | | | | | |
| Union Cons | 5 | 5 | 5 | 5 | 5 | 5 |
| Utah | 2¾ | 2¾ | 2¾ | 2⅝ | 2⅝ | 2⅝ |
| Wales Cons | | | | | | |
| Yellow Jacket | 3¼ | 3⅜ | 3⅜ | 3½ | 3½ | 3¼ |

The following are the financial balances of the various mining companies on September 1st:

CASH ON HAND.

| | | | |
|---|---|---|---|
| Alta | $32,784.66 | ‖ Day | $22.53 |
| * Argenta | 866.32 | Gould & Curry | 30,841.27 |
| Andes | 9,507.00 | Hale & Norcross | 4,985.92 |
| † Albion | 363.55 | Jackson | 3,849.85 |
| Benton Con | 8,476.11 | Mexican | 5,002.62 |
| Best & Belcher | 362.23 | Northern Belle | 13,290.13 |
| Bulwer | 914.08 | Ophir | 76,073.29 |
| Bodie Con | 13,287.02 | Occidental | 5,860.01 |
| ‡Belcher | 24,786.00 | Potosi | 8,158.34 |
| Crown Point | 23,591.28 | Scorpion | 168.77 |
| §Con. Virginia | 87,161.26 | Standard | 132,706.73 |
| California | 1,802.81 | Sierra Nevada | 15,608.45 |
| Con. Imperial | 4,479.19 | Savage | 22,509.63 |
| Chollar | 8,755.61 | Utah | 9,455.57 |
| Challenge Con | 5,365.28 | | |

INDEBTEDNESS.

| | | | |
|---|---|---|---|
| ** Grand Prize (overdraft) | $10,063.56 | Martin White (cash overdraft) | 66.11 |
| Lady Washingt'n | 4,052.98 | | |

** Outstanding draft $2,000.
* Albion indebtedness, exact amount not yet known; approximate $260,000.
† Due Sutro Tunnel Company, $10,920.
‡ Monthly expense of mine, amount unknown.
§ Outstanding drafts, $5,728.98.
‖ Bills payable, $91,151.81.

### Copper and Silver Stocks.

Reported by C. H. Smith, 15 Congress street, Boston, Stock Broker and Member of the Boston Mining and Stock Exchanges.

BOSTON, September 13.

The market for copper stocks has been quite strong the past week, and orders to purchase some of the best mines have resulted in an advance of prices, while but few stocks have been sold and but a limited amount offered. There is no change in quotations for ingot copper; but there is a firm tone to the market which, no doubt, strengthened the belief that some of the stocks have been selling below their value, and at present prices are undoubtedly low, and warrant an advance before the winter season sets in. Quincy has been in most active demand, and although less than two hundred shares are reported as sold, the price has advanced from $46@$53½, closing, however, at $52 bid, $53 asked. Calumet & Hecla advanced to $245, a gain of three points. Very little stock is offered, and it is difficult to fill orders at current prices. Franklin advanced from $9⅞@$11, with sales of 300 shares. This stock has been unduly depressed, and ought to sell higher. The non-payment of the expected dividend has, no doubt, had its

influence on the stock. Osceola is steady at $18, with but little stock in the market. Atlantic advanced $¼, with sales at $10¼. Huron was strong in the early part of the week, at $1⅞, without bringing out the stock; but later, from some reason which we could not learn, a block of 500 shares was put on the market and offered down to $1½ before finding a purchaser, and to-day $1⅝ was the best bid. Pewabic sold at $3⅜; but there is not much demand for it, as the outlook is not so promising as its friends could wish.

In silver stocks, there is very little doing. Bonanza Development was the most active, and advanced from $1⅛@$1⅜ on sales of 750 shares. Catalpa sold at 37½c., and very dull. It is reported that the mine is just about paying expenses, and not much outlook for a dividend this year. Sullivan advanced from 87½@97½c., at the Mining Board, where the stock has been quite active. Sales on buyer's option, 30 days, were made at $1.02½. Bowman Silver has ruled heavy for the week, and sales reported at 16c., and but little doing in it. Massachusetts & New Mexico, steady at 5@6c, the latter on buyer's option. Dunkin sold at 30c., but to-day 33c. was bid, 37½c. asked.

3 P.M.—There has been literally nothing doing in mining stocks to-day at the regular Stock Board, and very few sales at the Mining Exchange. We giv closing quotations: Calumet & Hecla, $245 asked Franklin, $10½ bid, $11½ asked. Huron, $1¼ bid. Osceola, $17½ bid, $20 asked. Pewabic, $3 bid, $3½ asked. Quincy, $49 bid, $52 asked. Allouez, $1¾ asked. Atlantic, $9 bid, $11 asked. Silver Islet, $2 bid. Bonanza, $1¾ bid, $1⅛ asked. Catalpa, 35c. bid, 37½c. asked. Sullivan, 90c. bid, $1 asked.

## METALS.

NEW YORK, Friday Evening, Sept. 14.

**Copper.**—The firm tone repeatedly referred to in recent issues continues. There are few sellers of Lake copper and a limited number of buyers, but better prices are paid. We quote 15⅛@15¼c. Other brands are slightly higher, 14⅛@14¾c. according to brand.

England is a little better, cabling £63 10s. for Chili Bars.

The following are Messrs. James & Shakspeare's statistics for the month of August:

| | Aug 1 to 31. Imports. Tons. | Deliveries. Tons. | |
|---|---|---|---|
| Fine foreign, chiefly Australian. | 699 | 1,152 | London. |
| Chili Bars | 715 | 1,378 | |
| Chili Ingots | 350 | 335 | Liverpool and Swansea. |
| Chili In ores and regulus | Nil. | Nil. | |
| American | 1,390 | 1,430 | |
| Spanish precipitate and sundries. | 3,074 | 2,433 | |
| Totals, England | 6,228 | 6,748 | |
| American | 670 | 710 | |
| Chili bars, ingots, and Barilla | 2,394 | 2,496 | France. |
| Sundries | 35 | 35 | |
| Total, England and France | 9,327 | 9,989 | |

| | Stocks. Aug. 31 Tons. | July 31. Tons. | |
|---|---|---|---|
| Fine foreign, chiefly Australian | 4,078 | 4,531 | London. |
| Chili Bars | 23,334 | 23,997 | |
| Chili Ingots | 451 | 436 | |
| Chili In ores and regulus | 1,813 | 1,813 | Liverpool and Swansea. |
| American | 138 | 178 | |
| Spanish precipitates and sundries | 4,457 | 3,836 | |
| Totals, England | 34,271 | 34,791 | |
| American | 390 | 430 | |
| Chili bars, ingots, and Barilla. | 2,047 | 2,149 | France. |
| Sundries | 30 | 30 | |
| Total, England and France | 36,738 | 37,400 | |
| Advised by mail and telegram: | | | |
| Chili | 11,207 | 11,147 | |
| Australian | 900 | 1,000 | |
| Stock and afloat, gross total | 48,845 | 49,547 | |

The pith of the statistics is given in the following figures for the first eight months of the year:

| | Jan. 1 to Aug. 31. 1883. Tons. | 1882. Tons. | 1881. Tons. |
|---|---|---|---|
| Imports | 60,421 | 51,353 | 49,789 |
| Deliveries | 58,810 | 53,609 | 53,246 |

This shows a very heavy increase in the imports, and a less marked growth in the deliveries.

**Tin.**—There has been considerable speculative activity, London holding at £94. We quote spot values: Straits, 21c.; Australian, 21⅛c.; Billiton, 21⅛@21⅝c.; and Banca, 21¾c.

**Lead.**—There has been some activity, and the happenings of the past few days have borne out the views which we print editorially to-day. There have been sales of 300 tons, ordinary Germania and other Western lead, at 4·32½c.; and as we go to press, it is rumored that an additional lot of 300 tons of Germania Common has been disposed of at a slightly lower figure. There have also been sold 180 tons of Germania Refined and 100 tons of another brand of Western Corroding at 4·35c., both to one white-lead manufacturer, while the common lead has been pretty widely distributed. These sales indicate clearly that, as soon as any effort is made to place even moderate quantities of lead, the market swerves under it. So far as the Western holders are concerned, their policy is apparently to keep our market here high, in order that its quotations may serve as a basis for the many minor transactions in other manufacturing cities, which take their cue from us. It is evident that, if any attempt were made to force a larger quantity on our market, it would promptly fall off under the weight. We quote 4·33¼c. for Common, and 4·35c. for Refined.

From St. Louis, Messrs. John Wahl & Son wire us to-day:

The market is a little easier. We record sales of 160 tons of Refined at 4·08c. and quote Common nominally 4@4·02½c.

Messrs. Everett & Post telegraph from Chicago as follows:

For both Common and Refined, there is a fairly active demand, and the prices are stiffly held, offerings being only moderate. Otherwise, there is no change of any description, quotations being nominally 4·10 4·12½c.

**Spelter.**—The firmer feeling still prevails, and it would be difficult to shade 4½c. for ordinary Western. Silesia is held at 5@5⅛c., without any business doing.

**Antimony.**—There is nothing new to report in this market.

## BULLION MARKET.

NEW YORK, Friday Evening, Sept. 14.

Nothing worthy of comment has occurred in the silver market abroad or here since our last week's ratings.

| DATE. | London. Pence. | N. Y. Cents. | DATE. | London. Pence. | N. Y. Cents. |
|---|---|---|---|---|---|
| Sept. 8 | 50⅝ | 109⅞ | Sept. 12 | 50⅝ | 110 |
| 10 | 50⅝ | 109⅞ | 13 | 50⅝ | 110 |
| 11 | 50⅝ | 110 | 14 | 50 11-16 | 110 |

*Bullion Receipts at New York.*—The bullion received from the mines at the various offices in this city during the week ended September 14th, as compiled from various sources, amounted to $181,300, as against $193,000, reported for the previous week. The receipts from January 1st, 1883, to date are $7,988,274.

*Exports and Imports of Gold and Silver at New York.*

*Exports.*

| | |
|---|---|
| Week ended September 8th | $450,590 |
| Corresponding week last year | 170,000 |
| Since January 1st, 1883 | 9,828,766 |
| Corresponding period last year | 43,626,267 |

*Imports.*

| | |
|---|---|
| Week ended September 8th | $225,480 |
| Corresponding week last year | 28,311 |
| Since January 1st, 1883 | 10,466,971 |
| Corresponding period last year | 2,607,338 |

*Foreign Bank Statements.*—The governors of the Bank of England, at their regular weekly meeting, reduced the bank's minimum rate for discount from 4 to 3½ per cent. During the week, the bank gained £140,000 bullion, but the proportion of its reserve to its liabilities was reduced from 47 11-16 to 46¼ per cent, against 39 3-16 per cent at this date a year ago. September 13th, the bank gained £29,000 bullion on balance. The weekly statement of the Bank of France shows losses of 2,575,000 francs gold, and of 4,475,000 francs silver.

*Purchase of Silver Bullion.*—The Treasury Department purchased 296,000 ounces of fine silver to-day for the mints at Philadelphia, New Orleans, and San Francisco.

BULLION PRODUCTION FOR 1883.

| MINES. | States. | Month of August. | Year from Jan. 1st, 1883. |
|---|---|---|---|
| *Alice, G. S. | Mont | | $568,441 |
| *Alta-Montana, G. L. S. | " | | $10,625 |
| *Belmont | " | | 12,604 |
| Bodie, G. S. | Cal | | 161,728 |
| Bodie Tunnel, G. | " | | 52,742 |
| *Bonanza King, G. | " | | 379,434 |
| *Boston & Montana, G. | Mont. | 5,274 | 128,830 |
| *Central Arizona. S. | Ariz. | | 35,845 |
| *Christy, S. | Utah | | 162,513 |
| *Chrysolite, S. L | Colo. | 21,378 | 284,308 |
| Consolidated Bobtail | Colo. | | 18,723 |
| *Contention, S. | Ariz. | | 635,413 |
| Crescent, G. | Cal. | | 13,000 |
| *Custer, G. S. | Idaho | | 43,572 |
| *Deadwood-Terra, G. | Dak. | | 241,517 |
| *Derbec Blue Gravel, G. S. | Cal | | 72,270 |
| Dunkin, S. L. | Colo. | | 32,015 |
| Evening Star, S. L | Colo | | 47,061 |
| *Father de Smet, G. | Dak. | | 208,851 |
| *Frisco M. and S. Co., G. S. L. | Utah | | $77,084 |
| Gunnell, S. | Colo. | | 58,828 |
| *Head Center Consolidated | Ariz. | | 28,368 |
| *Head Center and Tranquillity | Ariz. | | 80,198 |
| *Hecla Consolidated, G. S. | Mont. | | 293,922 |
| *Homestake, G. | Dak. | | 586,674 |
| *Hope, S | Mont | | 62,447 |
| Horn-Silver, S. L. | Utah | | 1,847,000 |
| *Howell S. and Mg. Co., G. S. L. | Ariz. | | 41,361 |
| Idaho, G. | Cal | | 88,642 |
| *Independence, G. S. | Nev. | | 32,991 |
| Iron Silver, S. L. | Colo. | | 503,831 |
| *Jocuistita, S. | Mex. | | ‡258,959 |
| *Kentuck, G. S. | Nev | | 15,412 |
| *Lexington, S. | Mont. | 112,147 | 856,703 |
| *Little Pittsburg, S. L. | Colo. | 12,414 | 54,505 |
| *Marguerite, G. | Cal | 3,034 | 65,594 |
| *Martin White, G. S | Nev. | | 136,317 |
| Morning Star, S. D | Colo. | | 84,428 |
| *Moulton, G. S. | Mont. | | 123,288 |
| Mount Diablo | Nev | | 262,100 |
| *Navajo, G. S. | " | | 411,642 |
| *North Belle Isle | " | | 2,153 |
| Northern Belle, S. | " | | 447,040 |
| *Ontario, S. L. | Utah | 194,283 | 1,409,544 |
| *Oxford, G. | N. S. | 4,734 | 45,265 |
| *Phœnix, G | S. C. | | 10,700 |
| *Pinal Consolidated, S. L. | Ariz | | 181,485 |
| *Satemo, G. | N. S. | | 2,500 |
| *Silver Bow, G. S. | Mont. | | 101,241 |
| *Silver Cord, G. S. L. | Colo. | | 703,333 |
| Standard, G. | Cal | | 738,401 |
| Star, S. | Nev. | | 27,095 |
| *Stormont, S. | Utah | 23,377 | 176,105 |
| Syndicate, G. | Cal | | 38,428 |
| Tintic M. and M. Co. | Utah | | 25,196 |
| *Tip Top, S. | Ariz. | | 37,868 |
| *Tombstone, G. S. L. | " | 51,574 | 548,764 |
| Wyoming Consolidated. | Cal | | 31,541 |
| Yellow Jacket, S | Nev. | | 265,885 |
| Total amount of shipments to date | | | $13,872,328 |

* Official. † Net value. ‡ Assay value. § Not including value of lead. *G. Gold. S. Silver. L. Lead.*

## IRON MARKET REVIEW.

NEW YORK, Friday Evening, Sept. 14.

Mr. Edward J. Shriver, Secretary of the Metal Exchange, has the following returns from 102 furnaces:

| | No. 1. | No. 2. | Bessemer, Forge, and lower grades. | Grade not specified. | Total. |
|---|---|---|---|---|---|
| Stocks Aug. 1 | 21,127 | 23,690 | 46,093 | 4,595 | 95,505 |
| " Sept. 1 | 21,682 | 23,850 | 39,523 | 5,719 | 90,774 |
| Production in July | 16,605 | 7,214 | 9,736 | 5,724 | 39,279 |
| " " Aug. | 17,746 | 5,772 | 6,851 | 7,532 | 37,901 |

**American Pig.**—We have had occasion to verify the statement of the condition of the market made in our last issue. What should be the busy season has set in, and thus far it shows no signs of meeting the expectations of makers. September and October are the months in which the largest amount of business is closed, and yet the orders on the books are few and limited. There is no doubt that consumption has fallen off more largely, particularly in some quarters, than was believed, and the theory that consumers are waiting until deliveries on contracts made in the summer are completed will not fully account for the dullness. Such season contracts were made later this year than in ordinary years, but they were also very much lighter.

Transactions during the week have been on a moderate scale. We quote No. 1 Foundry, $21.50@$23; No. 2, $19@21, according to quality; and Gray Forge, $18.25@$19.50, all at tide-water. Bessemer Pig is lifeless, and Spiegeleisen is quiet at $30.50@30.75 for 20 per cent. Lower grades are dull at @$25.50.

# NEW YORK MINING STOCKS.

## DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Highest and Lowest Prices per Share at which Sales were Made. | | | | | | | | | | | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. 8. | | Sept. 10. | | Sept. 11. | | Sept. 12. | | Sept. 13. | | Sept. 14. | | |
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alice, Mon. | | | | | | | 2.10 | | | | 2.15 | | 200 |
| Amie Con., Co. | 13 | | .15 | .14 | .19 | .16 | .19 | .17 | .22 | .18 | .23 | .20 | 32,250 |
| Argenta, Ne. | | | | | | | | | | | | | |
| Bar. & Walker, Ut. | | | | | | | | | | | | | |
| Bassick, Co. | | | | | | | | | | | | | |
| Belle Isle, Ne. | | | | | | | | | | | | | |
| Bodie Cons., Ca. | | | | | .75 | | .75 | .70 | .95 | | | | 650 |
| Breece, Co. | .19 | | | | | | | | | | .18 | | 1,000 |
| Bulwer, Ca. | | | | | .70 | | | | | | | | 100 |
| California, Ne. | | | .30 | | | | .24 | | | | .24 | | 1,950 |
| Cal. & Hecla, Mich. | | | | | | | | | | | | | |
| Carbonate Hill | | | | | | | | | | | | | |
| Caribou Con., Co. | | | | | | | | | | | | | |
| Chrysolite, Co. | | | 1.15 | | 1.10 | | 1.15 | | 1.25 | 1.15 | 1.20 | 1.15 | 4,600 |
| Cons. Va. Ne. | | | .56 | .55 | | | .53 | | .54 | | .54 | | 5,810 |
| Crown Point | | | | | | | | | | | | | |
| Deadwood-Terra, Dk. | | | | | | | | | | | | | |
| Dunkin, Co. | | | | | .35 | .32 | .36 | | .36 | .35 | .35 | | 1,800 |
| Eureka Cons., Ne. | 7.13 | | | | 7.50 | | 7.63 | | 7.63 | | | | 1,390 |
| Excelsior, Ca. | | | | | | | | | | | | | |
| Father de Smet, Dk. | | | | | 4.25 | | | | | | | | 50 |
| Findley, Ga. | | | | | | | | | | | | | |
| Gold Stripe, Ca. | | | | | .07 | | | | | | | | 300 |
| Gould & Curry, Ne. | | | 3.25 | | | | | | | | | | 5 |
| Grand Prize, Ne. | | | | | | | | | | | | | |
| Great Eastern, Dk. | | | | | | | | | | | | | |
| Green Mountain, Ca. | | | | | | | .70 | | | | | | 200 |
| Hale & Norcross, Ne. | 4.70 | | | | | | | | | | | | 100 |
| Hall-Anderson, N. S. | 1.25 | 1.15 | 1.25 | | | | 1.20 | | 1.20 | | 1.15 | | 6,200 |
| Hibernia, Co. | | | | | | | | | | | | | |
| Homestake, Dk. | | | | | | | | | | | | | |
| Horn-Silver, Ut. | | | 7.13 | 7.00 | 7.00 | | | | 7.00 | | 7.13 | 7.00 | 1,330 |
| Hukill, Co. | | | | | | | | | | | | | |
| Independence, Ne. | | | | | | | | | | | | | |
| Iron Silver, Co. | | | 3.10 | | 3.05 | 3.00 | 3.10 | 3.05 | | | 3.05 | 3.00 | 2,650 |
| La Plata, Co. | | | | | | | | | | | | | |
| Leadville C., Co. | | | | | | | .32 | .30 | | | .25 | | 231 |
| Little Chief, Co. | .50 | | .48 | .47 | .50 | .49 | .52 | .51 | .55 | | .61 | .58 | 7,600 |
| Little Pittsburg, Co. | | | | | | | | | .57 | | .63 | .60 | 1,100 |
| Martin White, Ne. | | | | | | | | | | | | | |
| Moose, Co. | | | | | | | | | | | | | |
| Navajo, Ne. | 2.50 | | | | | | | | | | | | 400 |
| Northern Belle, Ne. | | | 6.13 | 6.00 | | | | | 6.00 | 5.88 | 6.00 | 5.88 | 1,520 |
| North Belle Isle, Ne. | | | .45 | | .47 | | | | | | .45 | | 1,400 |
| Ontario, Ut. | | | | | | | | | | | | | |
| Opair, Ne. | | | 4.25 | | | | | | | | | | 5 |
| Plumas, Ca. | | | | | | | | | | | | | |
| Prussian, Colo. | | | | | | | | | | | | | |
| Quicksilver Pref., Ca. | | | | | | | | | | | | | |
| " Com., Ca. | | | | | | | | | | | | | |
| Rising Sun, Ca. | | | | | | | | | | | | | |
| Robinson Cons., Co. | .47 | .42 | .42 | .40 | .42 | .37 | .40 | .38 | .39 | | .39 | .38 | 28,300 |
| Saint Joseph's Lead. | | | | | | | | | | | | | |
| Savage, Ne. | | | | | | | | | | | | | |
| Sierra Grande, N. M. | 1.05 | | 1.05 | | | | | | | | | | 700 |
| Sierra Nevada, Ne. | | | 5.50 | | | | 4.10 | | | | 4.25 | 4.00 | 140 |
| Silver King, Ar. | | | | | | | | | | | | | |
| Spring Valley, Ca. | | | | | | | | | | | | | |
| Standard, Ca. | 5.38 | 5.25 | | | 5.50 | | 5.25 | | | | | | 380 |
| Stormont, Ut. | | | | | | | | | | | | | |
| Tip Top, Ar. | | | | | | | | | | | | | |
| Tombstone, Ar. | | | | | | | | | | | | | |
| Vizina, Ar. | | | | | | | | | | | | | |
| Yellow Jacket | 3.00 | | | | | | | | | | | | 100 |
| | | | | | | | | | | | | | |

## NON-DIVIDEND-PAYING MINES.

| NAME AND LOCATION OF COMPANY. | Highest and Lowest Prices per Share at which Sales were Made. | | | | | | | | | | | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sept. 8. | | Sept. 10. | | Sept. 11. | | Sept. 12. | | Sept. 13. | | Sept. 14. | | |
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Albion. | | | | | | | | | | | | | |
| Alta-Montana, G. | | | | | | | | | | | .04 | | |
| Am. Flag, S. | | | | | | | | | | | | .05 | .04 |
| Barcelona, G. | | | .34 | | | | | | .49 | .39 | .42 | | .42 |
| Bear Creek | | | | | | | | | | | | | .40 |
| Bechtel Con., G. | | | | | | | | | | | | | |
| Belvidere | | | | | | | | | | | | | |
| Best & Belcher, G. S. | | | 4.40 | | | | | | | | | | 5 |
| Big Pittsburg, S. L. | | | | | | | | | | | | | |
| Bradshaw, S. | | | | | | | | | | | | | |
| Buckeye | | | | | | | | | | | | .25 | |
| " pref. | | | | | | | | | | | | | 2,300 |
| Bull-Domingo, S. L. | | | | | | | | | | | | | |
| Bye and Bye. | | | | | | | | | | | | | |
| Calaveras, G. | | | | | | | | | | | | | |
| Clav'r'a W. & M. Co. | | | | | | | | | | | | | |
| Cal., B. H., G. | | | | | | | | | | | | | |
| Central Ariz'na, S. | .25 | | | | | | | | | | | | |
| Cherokee, G. | | | .01 | | | | | | | | | | 100 |
| Cholla. | 2.95 | | | | | | | | | | | | 2,600 |
| Climax, Co. | | | | | | | | | | | | | 500 |
| Cons. Imp'ri'l, G. S. | | | | | | | | | .09 | .08 | | | 100 |
| Crowell, G. | | | | | | | | | | | | | 1,800 |
| Dahlonega, G. | | | | | | | | | | | | | |
| Decatur. | .02 | | | | | | | | | | .02 | | |
| Dunderberg | | | | | | | | | | | | | 500 |
| Durango, G. | .05 | | | | | | | | | | | | 1,000 |
| Eastern Oregon. | .40 | | .40 | | .45 | .44 | .45 | .40 | .44 | .43 | .46 | .45 | |
| Elko Cons. | .11 | | .12 | | | | .12 | .10 | .12 | .10 | .11 | .10 | 4,400 |
| Enterprise. | | | | | | | | | | | | | 22,700 |
| Fannie Barret | | | | | | | | | | | | | |
| Globe Copper. | | | | | | | | | | | | | |
| Gold Placer, G. | | | | | | | | | | | | | |
| Goodshaw, G. | | | | | | | | | | | | | |
| Granville, G. | | | | | | | | | | | | | |
| Harlem M. & M. Co. | | | | | | | | | | | | | |
| Hortense, S. | | | | | | | | | | | | | |
| Imperial. | | | | | | | | | | | | | |
| Lacrosse, G. | | | | | | | | | | | | | |
| Lucerne. | | | | | | | | | | | | | |
| Mariposa Prec. G. | | | | | | | | | | | | | |
| " Com., G. | | | | | | | | | | | | | |
| Mexican, G. S. | | | | | | | | | | | | | |
| Miner Boy. | | | | | | | | | | | | | |
| Mono | | | | | | | | | | | | | |
| North Standard, G. | | | | | | | | | | | .09 | .07 | .10 |
| N. Horn-Silv'r, S. L. | | | | | | | | | | | | | 1,000 |
| Ori'nt'l & Miller, S. | | | | | | | 12 | | .10 | | | | 500 |
| Parnell | | | | | | | | | | | | | |
| Quartz Creek. | | | | | | | | | | | | | |
| Rappahannock, G. | | | | | | | | | .07 | | | | 1,000 |
| Red Elephant, S. | | | | | | | | | .06 | | | | 1,500 |
| Ruby, of Arizona. | | | | | | | | | | | | | |
| Silver Cliff, S. | .12 | | | | | | | | | | | | 500 |
| Sonora Con. | .25 | .24 | .25 | | | | | | .25 | .24 | .30 | .25 | .28 |
| South Bodie, G. | | | | | | | | | | | | | .26 |
| South Bulwer, G. | | | | | | | | | | | | | 11,300 |
| South Flite. | | | | | | | | | | | | | |
| South Pacific. | | | | | | | | | | | | | |
| State Line, 1 & 4, S. | | | | | | | | | | | | | |
| " Nos. 2 & 3, S. | | | | | | | | | | | | | |
| Sutro Tunnel. | | | | | | | .19 | | | | | .19 | |
| Taylor Plumas | | | | | | | | | | | | | 700 |
| Tioga. | | | | | | | | | | | | | |
| Unadilla, S. | | | | | | | | | | | | | |
| Union Cons., G. S. | 4.95 | | | | | | | | 4.90 | | | 5.00 | |
| | | | | | | | | | | | | | 550 |

Full tables giving the total amount of dividends, capital, etc., will be printed the first week of each month. Dividend shares sold, 102,471. Non-dividend shares sold, 63,455.

## BOSTON MINING STOCKS.

| | Sept. 7. | | Sept. 8. | | Sept. 10. | | Sept. 11. | | Sept. 12. | | Sept. 13. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Alloüez. | | | | | | | | | | | 1.75 | | 100 |
| Amie. | | | | | | | .15 | | | | | | 200 |
| Atlantic. | | | | | | | 10.25 | | | | | | 70 |
| Aztec. | | | | | | | | | | | | | |
| Bodie Con. | | | | | | | | | | | | | |
| Bonanza D. | 1.88 | 1.75 | | | 1.75 | | 1.88 | 1.81¼ | 1.88 | 1.75 | 1.75 | | 1,550 |
| Bowman Sil. | .17 | .16 | | | .17 | .16 | .16 | | .16 | | .16 | | 6,100 |
| Bruns. Ant. | | | | | | | | | | | | | |
| Bulwer. | | | | | | | | | | | | | |
| California. | | | | | | | | | | | | | |
| Cal. & Hec. | | | 242 | | | | 245 | | 245 | | | | 21 |
| Catalpa. | .20 | .37½ | | | .37½ | | .37½ | | .37½ | | .37½ | .30 | 1,625 |
| Central Ariz. | | | | | | | | | | | | | |
| Climax. | | | | | | | | | | | | | |
| Co. Virginia | | | | | .56 | .55 | | | | | .52 | | 300 |
| Copper F'lls | | | | | | | | | | | | | |
| Copperop. | | | | | | | | | | | | | |
| Crescent. | .12 | | | | | | .12 | | | | | | 400 |
| "Cusi". | | | | | | | | | | | | | |
| Decatur. | | | | | | | | | | | | | |
| Deer Isle. | .05 | | | | .05 | | | | .04 | | .05 | | 6,500 |
| Denver City | | | | | | | | | | | | | |
| Douglas. | | | | | | | | | | | | | |
| Duncan. | | | | | | | | | .15 | | | | 300 |
| Dunkin. | | | | | | | | | | | .35 | | 20 |
| Empire. | | | | | .20 | | .19 | | .20 | .19 | .19 | | 3,400 |
| Eureka Con. | | | | | | | | | 7.63 | | | | 10 |
| Franklin. | 10.00 | | | | | | 11.00 | | | | 11.00 | | 350 |
| Gila County | | | | | | | | | | | | | |
| Harshaw. | | | | | .62½ | | | | | | | | 100 |
| Huron. | | | | | | | | | 1.63 | 1.50 | | | 550 |
| Independ'ce | | | | | | | | | | | | | |
| Indian Q'n. | | | | | | | | | | | | | |
| Little Pitts. | | | | | | | | | | | | | |
| Mammoth. | .02 | | | | | | | | | | | | 500 |
| Mass. & N.M. | .06 | .05 | | | .05 | | .05 | | .06 | .05 | .05 | | 15,700 |
| Milton. | | | | | | | | | | | | | |
| Napa. | | | | | | | | | | | | | |
| National. | | | | | | | | | | | | | |
| North. Belle | 6.25 | | | | | | | | | | | | 25 |
| Ontario. | | | | | | | | | | | | | |
| Osceola. | 18.00 | | | | | | 18.00 | | 18.00 | | | | 32 |
| Penn-Breck. | | | | | | | | | | | | | |
| Pewabic. | | | | | | | | | 3.25 | 3.13 | 3.25 | | 400 |
| Pine Tree. | | | | | .09 | | | | | | | | 200 |
| Plymouth. | | | | | .10 | | | | .12 | .11 | .13 | | 1,600 |
| Quicks. com | | | | | | | | | | | | | |
| Quincy. | 49.00 | | 49.50 | 48.88 | 49.25 | | 50.50 | 49.50 | 53.50 | 52.00 | | | 162 |
| Robinson. | .46 | | | | .43 | | | | | | .40 | | 400 |
| San Pedro. | | | | | | | | | | | | | |
| S'ra Nevada | | | | | | | | | | | | | |
| S'ra Grande | | | | | | | | | | | | | |
| Silver Islet. | | | | | | | | | | | | | |
| Silver King. | | | | | | | | | | | | | |
| Simpson Gd | | | | | | | | | | | | | |
| So. Pacific. | | | | | | | | | | | | | |
| Standard. | | | | | | | | | | | | | |
| Sullivan. | | | | | .95 | | .97½ | .95 | 1.00 | | 1.00 | .97½ | 1,300 |
| Sutro Tun. | .20 | | | | | | | | | | | | 200 |
| Sycamore. | | | | | | | | | | | | | |
| Twin Lead. | | | | | | | | | | | | | |
| Vizina. | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |

## PHILADELPHIA MINING STOCKS.

| | Sept. 7. | | Sept. 8. | | Sept. 10. | | Sept. 11. | | Sept. 12. | | Sept. 13. | | Sales. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | H. | L. | |
| Amer. Cons. | | | | | | | | | | | | | |
| Argent. | .12 | | | | .11 | | .12 | .11 | .11 | | .11 | .10 | 14,500 |
| Aztec. | | | | | | | | | | | | | |
| Battle Mt. | | | | | .03 | | | | | | | | 2,000 |
| Buena. | | | | | | | | | | | | | |
| California. | | | | | | | | | | | | | |
| Cincinnati. | .07 | | | | | | | | .07 | | | | 8,300 |
| Comprom'e. | .16 | .15 | .17 | | .15 | | .15 | .14 | | | .15 | .14 | 20,400 |
| Contention. | | | | | | | | | | | | | |
| Con. Virg. | | | | | | | | | | | | | |
| Dauntless. | .02 | | .02 | | .02 | | | | | | | | 9,900 |
| Del Monte. | | | | | | | .08 | .04 | | | | | 9,000 |
| Denver City | .10 | | | | .10 | | .09 | | | | | | 2,300 |
| Eureka. | | | | | | | | | | | | | |
| Girard. | | | | | | | | | | | | | |
| Governor. | | | | | | | | | .04 | .03 | .03 | | 9,300 |
| Grand Uni'n. | .03 | | .03 | | .03 | | .03 | | .03 | | .03 | | 33,100 |
| Green Mt. | | | | | | | | | | | | | |
| Gunnison. | | | | | | | | | | | | | |
| Homestake. | | | | | | | | | | | | | |
| Horn Silver. | | | | | | | | | | | | | |
| Iowa Gulch. | .04 | | .03 | | .04 | .03 | .03 | | .03 | | .04 | .03 | 30,200 |
| Iron Silver | | | | | | | | | | | | | |
| King Bul'on | | | | | | | | | | | | | |
| Ledger Con. | | | | | | | | | | | | | |
| Little Dia'd. | | | | | | | .07 | | .08 | .07 | .07 | | 7,000 |
| Little Maud | | | | | | | | | | | | | |
| Little Pitts. | | | | | | | | | | | | | |
| L'g & D'y H. | | | | | | | | | | | | | |
| Montana | | | | | | | | | | | | | |
| Mt. Sheridan | | | .04 | | | | | | | | | | 2,700 |
| National. | | | | | | | | | | | | | |
| North'n B'l. | | | | | | | | | | | | | |
| Orion. | | | | | | | | | | | | | |
| Orion Pref. | | | | | | | | | | | | | |
| Palmetto E. | | | | | | | | | | | | | |
| Pembina. | | | | | | | .11 | | | | | | 600 |
| Penn-Breck. | | | .09 | | .09 | | .09 | | .10 | | .11 | .10 | 16,900 |
| Permanent. | | | | | | | | | | | | | |
| Pizarro. | | | | | | | | | | | | | |
| Pizarro Ex. | | | | | | | | | .02 | | | | 1,000 |
| Potosi. | | | | | | | | | | | | | |
| Rara Avis. | | | | | | | .15 | | | | .15 | | 1,100 |
| Rara Avis E. | .10 | | .10 | | .11 | .10 | .10 | | .11 | .09 | .10 | | 19,500 |
| Record. | | | | | | | | | | | | | |
| Rico Pion'r. | | | | | | | | | | | | | |
| Sierra Apac. | | | | | | | .18 | | | | .18 | | 450 |
| Sierra Be. la. | .57½ | | | | .55 | .50 | | | | | .60 | | 4,300 |
| Sierra G'nde | 1.05 | 1.00 | 1.07½ | .95 | 1.07½ | 1.02½ | 1.10 | 1.05 | 1.07½ | | 1.12½ | 1.07½ | 10,465 |
| Sierra Nev. | | | | | | | | | | | | | |
| Silver Cord. | | | | | 1.55 | | | | 1.55 | | | | 200 |
| Silver King. | | | | | | | | | | | | | |
| Silv'r Plume | .02 | | | | | | | | .02 | | | | 7,500 |
| Sonora Con. | | | | | | | | | | | | | |
| Standard. | | | | | | | | | | | | | |
| Sultana. | | | | | | | | | | | | | |
| Sutro Tun'l. | | | | | | | | | | | | | |
| Tombstone. | .90 | | .90 | .85 | .87½ | | | | | | | | 600 |
| Victor. | | | | | | | | | | | | | |
| Yale Mt. | | | | | | | | | | | | | |

At the Exchange, the following sales were reported the market closing weak and unsettled :

Saturday, 100 tons, No. 1, November, $21.87½ ; 100 tons No. 1, November, $21.75 ; 200 tons No. 1, January, $22.25. Monday, 100 tons No. 1, November, $21.87½ ; 100 tons No. 1, December, $22 ; 100 tons No. 1, January, $22.25 ; 100 tons No. 1, February, $22.25. Tuesday, 100 tons No. 1, December, $21.75 ; 600 tons No. 1, January, $22. Wednesday, 500 tons No. 1, January, $21.87½. Thursday, 100 tons No. 1, February, $21.87½ ; and to-day, 300 tons No. 1, February, $21.87½.

**Scotch Pig.**—Though arrivals have been light, there is a growing tendency to send them to store. A part of the pig coming in is delivered on contracts still running, while only a comparatively small proportion is brought in by outsiders, who are apparently giving up the business in disgust. Freights are slightly higher.

We quote ex ship : Coltness, $23.50@$24 ; Langloan, $23@$24 ; Summerlee, $23 ; Dallmellington, $20.50@$21 ; Eglinton, $20@$20.50 ; and Glengarnock, $22 $22.50.

At the Exchange, the following lower cable quotations were received : Coltness, 59s. ; Langloan, 58s. 3d. ; Summerlee, 56s. 6d. ; Gartsherrie, 56s. ; Glengarnock, at Ardrossan, 54s. 9d. ; and Eglinton, at Ardrossan, 47s. 9d. Warrants to-day were 46s. 5d.

**Steel Rails.**—We have been unable to learn that any large orders have been placed, as rumored. The one in the market, referred to in these columns before, was for June, July, and August delivery, the section being a difficult one, and the inspection severe. This lot has not yet been placed, according to good authority. For small lots, early delivery, the quotation remains $37.50 at mill.

**Old Rails.**—No business of magnitude is reported. We quote $23.50 for Ts.

**Scrap.**—Beyond sales of small lots from yard, there is nothing to note. We quote $23@$23.50 ex ship.

**Philadelphia.** September 13.

There are indications that the lull in the demand for iron, which has lasted for several weeks, will soon terminate in a healthful activity. This is indicated by the number of inquiries for forge and foundry iron, and offers made a little below makers' terms. A number of buyers of forge irons have been in the market to buy enough for sixty days ; but the general run of buyers are still purchasing for current requirements and trusting to future output to bring lower prices. This is becoming more and more dangerous, on account of the number of heavy sales which have recently taken place. Good brands of Forge are scarce, and, during the last few days, consumers have been paying $18.50@$19 at furnace, but there is still a good deal of iron to be had at $18. There are plenty of offers in hand at $17.50, but nothing but an inferior iron can be had at that price. Inquiries for 1000-ton lots of Forge are made, with offers at $17@$17.50, but very little business of this kind is done as yet. It is probable that, during the next week or ten days, buyers will decide what they will do, and pay about $18 or $18.50. Foundry irons are selling at $22@$23 for No. 1 and $19@$21 for No. 2, averaging about $20 and $22 for the two numbers. If all the offers made were accepted, business would be active. Makers feel themselves safer now than two weeks ago. The restriction in production during the second quarter of the year is beginning to tell, and wise buyers are beginning to look for supplies before any decided upward tendency can manifest itself.

Bessemer is quoted as usual at $21@$21.50, without business of any importance. There are offers at less. Scotch iron is moving more freely, but in small lots. English iron is under inquiry, but no purchases have been made.

*Muck Bars.*—Sales of Muck Bars have been made at $33.50, with $34 generally asked.

*Blooms.*—A few lots of Charcoal Blooms have sold at $57@$58.

*Merchant Iron.*—Merchant iron is moving at 2·10@2·25c. The cutting of rates which has been going on for the past thirty days seems to be discontinued. There are fears of Western competition, and this leads to the naming of lower rates than would be named otherwise. For large lots, 2·10c. is taken, but 2·15@2·20c. are the usual prices.

*Nails.*—Nails are quoted at $3, and are quite active, but in lots smaller than car-load. Lots for export are selling at $2.90. Stocks are not large, and, if the West does not get too anxious to sell, the above figures can be maintained.

*Plate-Iron.*—Quite a number of small orders of 50 to 100-ton lots have been taken this week at 2·40@2·50c. for Common and 3@3·25c. for Shell, with Flange at 4@4·15c.

*Structural Iron.*—Structural iron manufacturers report an active inquiry for bridge iron, and orders for early delivery for building purposes. The mills are well supplied with business, and prices, in small lots, are firmer than usual, at 2·30@2·50c. for Tank. Beams, Channels, and Tees are unchanged. Inquiries for several hundred tons have been made, and the outlook points to a steady activity up to the winter months.

*Sheet-Iron.*—The sheet mills are all crowded with orders, most of them all for delivery during this and next month, and business is likely to be closed this week for November delivery. Prices are firm.

*Wrought Pipes and Tubes.*—This week's business was done between 70 and 75 per cent off for pipes, and boiler tubes 60 off in small lots. The aggregate of consumption is heavy.

*Steel Rails.*—No change has taken place in rails, although large transactions are said to be on the point of closing at or below $37. A large amount is wanted, and buyers seem to insist upon the acceptance of their own terms. Old rails are quiet with $23 bid, and offers at $24. Scrap is without change, and demand light.

**Pittsburg.** September 13.

The American Tin Plate Association has just issued a circular, which is distributed by thousands over the country, calling attention to the prostrate condition of that industry and the means of relief which that Association intends to advocate before the next Congress. All persons who favor the imposition of a protective duty are requested to send their names, addresses, and occupations, that they may be added to the list of names now under compilation. The Western Nail Association met to-day, and took the necessary and proper action for the protection of the interests of the nail trade. The demand for nails has fallen off during the past few weeks, owing to the completion of the contracts for building requirements, and considerable apprehension is felt as to the possibility of disposing of the output of the 2500 machines throughout the West. Stocks are slowly increasing, but the market has been tempted to make heavier purchases by concessions to $2.75 and $2.70.

The merchant iron trade is lacking in activity, because of the apprehensions in consumers' minds that the producing capacity is so far above requirements as to lead to competition which will yet depress prices below the exceptionally low limits of 1·80c., which is now named for large lots. Small lots are 1·90@2c. Producing capacity is working to about 80 per cent. The merchant steel mills are working to almost full capacity, and deliveries are made upon summer contracts throughout the West ; but the new fall business comes in very slowly.

Heavy concessions have been made on forge iron to secure business. Gray Forge is selling at $17.50@$18.50 ; No. 2 Foundry, $20 ; C. B. Charcoal, $33@$35, four months' time, and $26@$29, cash, according to quality. One thousand tons Muck Bar sold at $33.50. Wrought pipes and tubes are active. Pipes are selling at 75 per cent off list. Oil-well Castings, 43@45c. per foot. Two sales of American Ts were made at $24. Inquiries are out for English Ts, and Eastern buyers have orders for several thousand tons at fixed prices, which it is not probable will be filled for some time. The demand for Spikes is active at 2·60c. shaded. Track-bolts are 3c. Construction Iron, Plate, and Tank, are in active request, and mills are crowded with orders for sixty days.

## COAL TRADE REVIEW.

NEW YORK, Friday Evening, Sept. 14.

### Anthracite.

By energetic work, chiefly on the part of middlemen, the anthracite coal which comes to this market is taken care of. Buyers have not awakened from their lethargy, and the market drags along There is no accumulation of stocks, so far as we can learn ; but on the other hand, prices show no signs of materially improving. On the contrary, the trade has every reason to indulge in congratulations that coal has not followed the example of every leading industry of tending to materially lower figures. We have expressed our views concerning the best course to pursue to maintain this desirable state of affairs.

From the East, come discouraging reports. A correspondent writes us this week : "Hardly any coal has been sold." The low freights from Philadelphia give the shippers from that port an advantage equivalent to 25@30c., which the Boston agents of New York parties must meet.

Concerning the West, the special correspondent of *Coal* writes :

If, with the experience of the past week confronting them, there remain any operators in the coal market who maintain that an advance in circular rates necessarily means an advance, or even stiffening up, in selling prices, such benighted operators are simply past conviction to reason. Your correspondent has yet to meet with the first wholesale dealer or shipper in this market who honestly contends that the advance in the circular one week ago to-day has had the least effect either on the activity of the market or on prices. Anthracite is selling at just about the same rates as in June and July, and there is just about as much cutting in circular rates proportionately as then. Milwaukee is, if any thing, more of a thorn in the flesh of the Chicago trade than it was last year. A good proportion of the shortage in our supply of anthracite, as compared with that on hand a year ago, has been diverted to Milwaukee, that market having about 50,000 tons more, while Chicago has about 96,591 less, than one year ago.

To the iron trade, the following notes on coke from the letter of the Pittsburg correspondent of *Coal* will be of interest:

Coke remains at the price quoted last, your exchanges to the contrary notwithstanding. A statement has gone forth that "an advance to $1.10 has taken place." This of itself is vague. It is too low for foundry and a trifle high for furnace orders. The fact of the matter is, that coke is selling at $1.05@$1.10 for furnace orders, free on board, and $1.15@$1.25 for foundry and selected, and there has been no change for nearly two months. Manufacturers, however, talk of advancing rates 5 or 10 cents next month, dependent on the condition and prospects of the iron trade in the interim. The "pool" question excites more interest than the markets in coke just now. Appearances indicate that the present pool will be broken up and that the Vanderbilt line and the Baltimore & Ohio will be awarded a larger share of the trade which is now enjoyed by the Pennsylvania and its leased lines. If these lines can not agree on a new pool, so much the better for the coke men, who seem to sniff a cutting of rates in the near future. Crushed coke is inquired for at $1.75 per ton at the crusher. Its merits as a substitute for hard, at three times that price, are becoming yearly more recognized in the market. The scarcity of cars in this trade which existed a week ago has about ended, and shippers are not complaining on this score.

### Bituminous.

We are informed that the recent troubles among the miners in the Clearfield region are over. There is a slight scarcity of cars there. In general, a little improvement in the number of inquiries is noted, though quotations remain at the low figures.

**Horsford's Acid Phosphate.**
**Valuable in Indigestion.**
DR. DANIEL T. NELSON, Chicago, says : "I find it a pleasant and valuable remedy in indigestion, particularly in overworked men."

## DIVIDENDS.

HOMESTAKE MINING COMPANY, MILLS BUILDING, 15 BROAD STREET,
NEW YORK, Sept. 12, 1883.

DIVIDEND NO. 61.

The regular monthly dividend of FORTY CENTS per share has been declared for August, payable at the office of the Transfer-Agents, Lounsbery & Haggin, Mills Building, 15 Broad Street, on the 25th inst.
Transfer-books close on the 20th.
LOUNSBERY & HAGGIN, Transfer-Agents.

THE CENTURY CONSOLIDATED MINING AND SMELTING CO.; OFFICE, ROOM 56 TRIBUNE BUILDING.
NEW YORK, Sept. 14, 1883.

Notice is hereby given that a special meeting of the stockholders, for the purpose of amending the company's by-laws, will be held at the office of this company on Tuesday, October 2d, at 3.30 o'clock P.M.
By order, B. FRANK WOOD, Secretary.

G. E. RANDOLPH & CO.,
CENTRAL CITY, COLORADO,
GENERAL AGENTS FOR NON-RESIDENT OWNERS OF ACTIVE OR IDLE MINES.
Correspondence Solicited.

THOMAS BINNS,
METALLURGIST AND ASSAYER,
GOLD AND SILVER REFINER.
Practical Mill Runs of Ores, 500 Lbs. or Upward.
**Mine Examinations and Reports Made.**
279 FRONT STREET, NEW YORK.
SUCCESSOR TO BOSTON METALLURGICAL WORKS.
**ORES TREATED BY ALL PROCESSES.**